# Appendix 2

Wetlands

# Kodiak Airport EIS Wetland Delineation Report



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May 2008

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# A Landscape Setting and Land Use

# A.1 Landscape Setting

Vigil-Agrimis, Inc. prepared this wetland delineation report for the Kodiak Airport EIS. The Kodiak Airport is about 5 miles south of the City of Kodiak on the northwest coast of Kodiak Island, Alaska. The proposed activities being reviewed in the EIS include improving runwayend and lateral-runway safety areas for Runway 18/36 and Runway 7/25.

The wetland delineation study area is generally located east of the Chiniak Highway. It is bordered on the south by the U.S. Coast Guard Base, on the east by St. Paul Harbor and on the north by the Buskin River. The study area includes a small part of the Buskin River State Recreation Area north of the River and a small area west of the Chiniak Highway off the end of Runway 7/25.

The area in the vicinity of the study area, as mapped by the U.S. Geological Survey (USGS), is illustrated in Figure 1. Color aerial photography (2004) in the immediate study area is illustrated in Figure 2. All figures are in Appendix A.

#### A.2 Previous Land Use

Kodiak, Alaska, was a center of the fur and whaling trade in the 1800s. The local economy transitioned to salmon by the turn of the century. The land in the vicinity of what is now the Airport began to be managed by the U.S. military prior to World War II. The development of naval facilities required extensive alteration to the natural terrain to level large coastal areas for the construction of a naval air station. The land in the study area was used as an airfield through the war by both the Navy and Coast Guard. Management of the complex was transferred exclusively to the Coast Guard in 1972.

#### A.3 Current Land Use

The majority of the study area is within Kodiak Airport which is the only airport on the island able to service commercial airlines and large aircraft. The land within the study area is primarily runway and taxiway but also includes unpaved grass infields and historic airport revetments. The Airport extends to the top of the south bank of the Buskin River. The study area also includes the banks and estuary of the river as well as portions of the Buskin River State Recreation Area north of the river. The Recreation Area is a popular fishing destination with picnicking and camping facilities and beach access.

# **B** Study Area Alterations

The development of naval facilities required extensive terrain alteration to level large coastal areas for the construction of a naval air station. The major earthwork was conducted between the late 1930s through World War II. At that time the southern portion of the Buskin River floodplain and delta was leveled and/or filled. Devil's Creek was also diverted and placed in a culvert under the Airport. A number of small streams were redirected into ditches and culverts. There is evidence of change in the Buskin River vicinity in historical air photos following the 1964 tsunami. However, it is unclear if the visible changes were due to the tsunami, subsidence from the earthquake, or subsequent human activity.

# **C** Precipitation Data and Analysis

The climate in this area is generally characterized as marine and mild with a relatively small daily and annual temperature range. Winter temperatures are between 20°F and 40°F while summers are between 40°F and 72°F. Rainfall occurs year round from just over 3-inches in drier months to just over 6-inches in wetter months. Mean annual precipitation is approximately 75 inches.

The nearest WETS Station is at Kitoi Bay (AK4812), located on the east side of Afognak Island about 30 miles due north of the study area (Appendix B). According to the Alaska Climate Research Center (ACRC) mean annual precipitation at Kitoi Bay is about 8-inches greater that at Kodiak Airport (ACRC, 2008). Based on Kitoi Bay station record (1961-1990) the growing season in the area runs from April to October.

The general weather pattern characterizing the growing season in Kodiak leading up to the wetland delineation field work would be described as wet and moderately warm. The delineation was conducted on September 11-13, 2007. Year-to-date precipitation up to the time of the delineation was approximately 59.51 inches. Average year-to-date precipitation is 47.69-inches; therefore the year's precipitation was 11.82 inches above or about 25% greater than average. This is above the normal precipitation range identified in the Kioti Bay WETS table but given the difference in annual precipitation amounts between Kioti bat and Kodiak Airport rainfall was considered analogous of a typical growing season.

Rain was substantial during the period immediately prior to and during the delineation (2.49 inches). Table 1 summarizes the precipitation at the time of the delineation. Precipitation for August-September averages 5.97 inches, roughly 1.00 inch above typical precipitation, which averages 4.93 inches during the April-September window of the growing season.

Table 1. Summary of Precipitation in Se	ptember 2007 in Kodiak, A	Alaska
Category	September 5	September 13
24 Hour Precipitation	0.29 inches	0.42 inches
Monthly to Date	1.14 inches	3.63 inches
Normal Monthly to Date	0.86 inches	2.81 inches
Percent of Normal Recorded	132 percent of normal	129 percent of normal

<sup>\*</sup>As determined AccuWeather, Inc. 2007 as published in the Kodiak Daily Mirror on the dates above.

# **D** Methods

Wetlands areas were delineated using the "triple parameter" method described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) as modified by the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region* (Corps 2006). Wetlands are required to have a prevalence of wetland hydrology, hydric soils, and hydrophytic vegetation. Jurisdictional wetlands are determined when positive indicators of all of these three criteria are present. The wetland boundaries and classifications described herein represent best professional opinion based on the site conditions observed. Final boundaries may vary after review and acceptance by the U.S. Army Corps of Engineers (Corps).

The typical wetland delineation methodology was employed and no project specific adaptations were made. Specifics of the delineation included:

- Site visit date: September 11 through 13, 2007. Some vegetation was not identifiable because the delineation was late in the growing season.
- The February 2006 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region was used to identify potential wetlands. No deviations were made from the Manual.
- Fifteen sample plots were taken to describe seven wetlands. A majority of these were paired upland/wetland plots; however, data was collected only at wetland plots at three wetlands where subsurface was rock or was too hard to dig a pit in upland areas. Generally the paired plots were located very close to each other not more than 10 feet apart.
- Off-site methods were not used in this delineation. However, 1-foot interval survey data and high resolution aerial photography were used to verify boundary and point locations collected using GPS.
- Farmed, pastured or other potential atypical areas were not encountered; requiring no special evaluation.
- Before field work started, the following references were used to help initially identify wetland features and suspect areas: the Soil Survey of the US Coast Guard Reservation, Kodiak Island, Alaska (1980) as described in Section D.1 and Figure 3; the Kodiak (C-2 and D-2) 15-minute National Wetlands Inventory (NWI) maps (1988) (Figure 4); and the Revised Final Wetland Delineation Study of the Coast Guard Integrated Support Command Kodiak, Alaska (Dames & Moore 1999) as described in Section F.

#### D.1 Soils

Soils at each representative wetland sample point were typically inspected to a depth of 16 inches to determine the presence or absence of hydric soils (wetland conditions). Plots were shallower in locations where bedrock and/or compacted gravel and cobble material prevented full excavation. At each sample location, the soil matrix color, soil texture, and presence of redoximorphic features or gleying were recorded. Soil hue, value, and chroma were determined using Munsell Soil Color Charts (Munsell Color Services 2000).

Soils in the study area are illustrated in Figure 3 and described in Table 2. As documented by historical references and verified by the soil surveys, the study area has been disturbed by human alterations. Three of the five soils found in the study area are Made Land. Made Land (25) is not on the hydric soil list. Made Land-Kodiak Complex (21) and Sharatin-Made Land Complex (22) have hydric inclusions of Kodiak and Sharatin soils which are hydric. Pasangshak very fine sandy loam (8) and Kodiak loamy fine sand (6) are hydric soils.

1	able 2. Soils Mapped	by SCS within the Study Area
Soil Phase (Map Unit)	Hydric / Hydric Inclusions*	Location of Mapped Occurrence
Kodiak loamy fine sand (6)	Yes: 1 and 2B3 rating	Kodiak loamy fine sand (6) occurs east of the Chiniak Highway on the slopes of Barometer Mountain
Pasangshak very fine sandy loam (8)	Yes: 2B3 rating	Pasangshak very fine sandy loam (8) is present in the tidally influenced estuary area of the Buskin River.
Made Land-Kodiak Complex (21)	Kodiak Inclusions: 1 and 2B3 rating	Made Land-Kodiak complex (21) is present in moderately developed areas of the Coast Guard Reservation and Airport.
Sharatin-Made Land Complex (22)	Sharatin Inclusions: 2B3 rating	Sharatin-Made Land complex (22) is present in the developed areas of the Buskin River State Recreation Area.
Made Land (25)	No	Made Land (25) is present in highly developed areas of the Airport and Coast Guard Reserve such as runway and taxiways.

<sup>\*</sup>As determined by the US Department of Agriculture, Soil Conservation Service (1980) and Natural Resources Conservation Service (NRCS) online lists of hydric soils (http://soils.usda.gov/use/hydric/)

Note: Hydric Soils list was not available for the US Coast Guard Reservation Soil Survey so the Northeast Kodiak Island Area Hydric Soil List was used. It includes the same soil names but uses different soil symbols.

Soils in the study area have been altered by grading and the placement of fill material. Much of the soil in the immediate vicinity of the runways and taxiways includes imported gravels that were often highly compacted. In many cases, a thin layer (~5 inches) of soil had accumulated above this gravel layer. In several locations, where surface inundation/saturation and obligate vegetation were evident, these shallow soils did not meet the criteria for hydric or problem hydric soils outlined in the Interim Supplement (Corps 2006). In these cases, soils were considered hydric based on best professional judgment.

# D.2 Hydrology

Hydrology was determined by the presence of saturation, water lines, drift marks or by inundation. Secondary indicators were used. The fieldwork was conducted in September, but there had been rain for much of the previous week. Field conditions were determined to be roughly analogous to typical growing season conditions and therefore neutral in affecting the presence of wetlands.

# D.3 Vegetation

At each sample point, the absolute percent cover for each dominant species in the plot area was visually estimated and recorded. Each sample point has a 1.5-meter (5-ft) radius for herbs and a 9-meter (30-ft) radius for saplings, shrubs, trees and woody vines. The prevalence index was then calculated for these species.

The USFWS <u>National List of Plant Species that Occur in Wetlands: Northwest (Region 10)</u> and the supplement to that list were the references used to determine the indicator status of the vegetation. There were some grasses that could not be identified to species given the timing of the delineation.

Upland native vegetation in the study area typically included either dense Sitka spruce (*Picea sitchensis*) with sparse understory vegetation; or riparian vegetation including wavy-leaved alder, (*Alnus sinuata*), black cottonwood (*Populus balsamifera*), red elderberry (*Sambucus racemosa*), salmonberry (*Rubus spectabelis*), willows (*Salix spp.*), and an understory with lady fern (*Athyrium filix-femina*).

# **E** Description of All Wetlands and Other Non-Wetland Waters

An overview of the wetlands and non-wetland waters in the study area vicinity is shown in Figure 5. There are seven wetlands in the study area. In addition there are three named streams and two unnamed stream networks. All of these streams pass through the study area, two in culverts. Because the study area is located on St. Paul Harbor it also includes marine shoreline.

#### E.1 Wetlands

Data from the fifteen plots (Appendix C) was analyzed and led to identification of seven wetlands. Color photographs of the plots and their locations are included in Appendix D. Six of the wetlands were dominated by emergent vegetation and one was a scrub shrub dominated wetland. One of the emergent wetlands also had a scrub shrub component.

#### **E.1.1 Wetland A – E2EM1**

Wetland A is a 9.6-acre intertidal estuarine wetland dominated by persistent emergent vegetation (Figure 5 and 6). It is entirely within the study area. The boundary of the wetland is clearly demarcated by topography and a change in vegetative community from salt-tolerant plant material to salt-intolerant plant material on the uphill side and to a mosaic of exposed river bed and mud flat. Data was collected at three sets of paired plots to determine the landward boundary location north, south and east of the Buskin River channel. Hydrology, soil and vegetation findings varied between locations.

Wetland A is saturated from a combination of sources. The primary source is daily tidal inundation. This is augmented with occasional fresh water inputs from high flows in the Buskin River. Precipitation and surface water flows from adjacent uplands associated with rainfall events also contribute to the wetland hydrology. The surface topography of the wetland varies slightly creating a mosaic of tidal plant communities based on their tolerance to tidal inundation.

The soils associated with this wetland are mapped by NRCS as Pasangshak very fine sandy loam, Sharatin-Made Land Complex, Made Land, and Water. Field assessment found that texture and color varied by location. Soils on the spit were sandy with a color of Gley1 7/10Y near the surface and Gley1 2.5/N at depth. Redox concentrations in the matrix and pore linings were common and prominent (7.5YR 3/4). South of the Buskin there was evidence of historic land surface alterations and the soil was more disturbed. Fine sandy silt (2.5YR 3/1) was above a layer of gravels with many distinct redox concentrations (5YR 4/8). On the north side of the Buskin River the soil was a mucky silty-sand (2.5Y 3/1) over a layer of sand and ash (10YR 6/4). Redox concentrations in the matrix were common and prominent (5YR 3/4).

The frequently inundated areas of the wetland are dominated by Lyngby's sedge (*Carex lyngbyei*) and mud sedge (*Carex limosa*). Higher, less frequently inundated elevations are dominated by a dunegrass (*Elymus mollis*) and bluejoint (*Calamagrostis canadensis*) community.

The national hydrogeomorphic (HGM) classification of this wetland complex is estuarine fringe with a subclass of tidal salt water.

#### E.1.2 Wetland B - PSS

Wetland B is a 0.15-acre palustrine scrub shrub wetland (Figure 5 and 6). It is located on a low terrace on the north bank of the Buskin River and is entirely within the study area. The boundary of the wetland coincides with the toe of slope of the bluff south of the river and a change in vegetative community from willow to alder and spruce. Data was collected at one set of paired plots to determine the landward boundary location north of the Buskin River channel.

Wetland B is primarily saturated from precipitation and precipitation-caused surface water flows from adjacent uplands. This is augmented with occasional fresh water inputs from high flows in the Buskin River. The surface topography of the wetland is a shallow linear depression that parallels the river channel and may be an abandoned side channel or a floodplain feature created by periodic floods.

The soil associated with this wetland is mapped by NRCS as Water or Pasangshak very fine sandy loam. Field assessment found that texture was silty clay loam over ash and then clay. The matrix color was 10YR 3/2 with common distinct concentration in the matrix of 5YR 4/6. This transitioned to a matrix of 5Y5/1 at depth common distinct redox concentrations (5YR 4/6) in the matrix and at pore linings.

The wetland is dominated by willow (*Salix spp.*) and bluejoint (*Calamagrostis canadensis*) with mud sedge (*Carex limosa*) in wetter areas.

The national HGM classification is depressional outflow.

#### E.1.3 Wetland C - PEM

Wetland C is a 0.25-acre palustrine emergent wetland located in a shallow depression (Figure 5 and 7). A culvert conveys water to the wetland at its southeastern tip. The wetland is adjacent to Runway end 11. The boundary of the wetland coincides with a distinct break in vegetation from tussock cottongrass and sedge to upland grasses and weeds and surface water ponding. The wetland gets shallower as it extends to the northwest. Data was collected at one plot to determine that this area was a wetland. A paired plot was not possible as we were unable to dig a pit due to compacted gravel material in areas without surface water hydrology and vegetation indicators.

Wetland C is saturated from precipitation and surface water flows from adjacent uplands associated with rainfall events. The surface topography of the wetland is a shallow linear depression that originates at a culvert outfall.

The soils associated with this wetland are mapped by NRCS as Made Land-Kodiak Complex. Field assessment found that texture was gravel in a matrix of clay loam. The color was Gley1 4/N near the surface. We were unable to dig below 6-inches due to a highly compacted gravel-cobble layer.

Vegetation in this area had been mown so the vegetation plot was increased to a 15-ft x 3-ft swath to document representative wetland vegetation. The wetland is dominated by obligate and facultative species including tussock cottongrass (*Eriophorum vaginatum*), sparseflower sedge (*Carex tenuiflora*), and meadow barley (*Hordeum brachyantherum*).

The national HGM classification is depressional outflow.

#### E.1.4 Wetland D - PEM

Wetland D is a 0.11-acre palustrine emergent wetland that is located in a linear depression adjacent to Runway 18/36 (Figure 5 and 7). A culvert conveys water to the wetland at its southeastern tip. The wetland is entirely within the study area. The boundary of the wetland coincides with a distinct break in vegetation from sedge to upland grasses, weeds and mown upland trees and shrubs. Surface saturation is coincident with this change in vegetation. The wetland gets shallower as it extends to the northwest and ends at a catch basin that drains to St Paul Harbor at Runway end 29. Data was collected at one set of paired plots to determine the boundary location.

Wetland D is saturated from precipitation and surface water flow from adjacent uplands associated with rainfall events. The surface topography of the wetland is a shallow linear depression that originates at a culvert outfall.

The soils associated with this wetland are mapped by NRCS as Made Land. Field assessment found that texture was a silt matrix with some gravel and a matrix color of 10YR 2/1 near the surface. We were unable to dig a pit below 4-inches due to a highly compacted gravel-cobble layer.

This highly altered wetland is dominated by obligate vegetation including sparseflower sedge (*Carex tenuiflora*) and a rush with no common name (*Juncus alpinus*).

The national HGM classification is depressional outflow.

#### E.1.5 Wetland E - PEM

Wetland E is a 0.22-acre palustrine emergent wetland that is located along the fringe of a linear drainage ditch (Figure 5 and 8). The ditch and the wetland fringe are interrupted by sections of culvert. The resulting series of wetland polygons parallels the taxiway adjacent to Runway 11/29 near Government Hill. It is entirely within the study area. This area is the low point in the drainage system as culverts convey water to the ditch and wetlands from both the northwest and the southeast to a catch basin at the base of Government Hill. From the catch basin water is conveyed by ditch to St. Paul Harbor at Runway end 29.

The boundary of the wetland coincides with a break in vegetation from mostly bluejoint to a mix of upland grasses and herbs. Data was collected at one set of paired plots to determine the boundary location.

Wetland E is saturated from precipitation and surface water flows from adjacent uplands associated with rainfall events and water flowing through the ditch. The surface topography of the wetland is steeply sloping banks and low terraces along a linear drainage that originates at culverts at both ends.

The soils associated with this wetland are mapped by NRCS as Made Land. Field assessment found that texture was clay with some gravel at depth. The matrix color was Gley1 4/10Y and included few indistinct redox concentrations above 8-inches.

The wetland is dominated by bluejoint (*Calamagrostis canadensis*).

The national HGM classification is riverine flow-through.

#### E.1.6 Wetland F - PEM

Wetland F is a 0.05-acre palustrine emergent wetland that is located in a depression just upslope of and adjacent to a drainage ditch along the taxiway south of Runway 7/25 (Figure 5 and 9). Water enters the ditch to the west from a natural drainage and the wetland has a surface water connection to that drainage. The wetland is entirely within the study area. The boundary of the wetland coincides with a distinct break in vegetation from sedge to rock and gravel. Surface water ponding is coincident with this change. Data was collected at one plot to determine that this area was a wetland. A paired plot was not possible as we were unable to dig a pit due to compacted gravel material near the surface in areas without surface water hydrology and vegetation indicators.

Wetland F is saturated from precipitation and surface water flows from adjacent uplands associated with rainfall events and possibly by groundwater. The surface topography of the wetland is a shallow depression at the base of a rock face.

The soils associated with this wetland are mapped by NRCS as Made Land-Kodiak Complex. Field assessment found that texture was a silty clay matrix transitioning to gravel. The matrix color was Gley1 5/10Y near the surface. We met refusal at 4-inches at a highly compacted gravel-bedrock layer. This soil was clearly reduced but was not underlain by soil of hue 5Y or redder. In light of the vegetation described below, the soil is considered Alaska Gleyed Without Hue 5Y or Redder Underlying Layer.

The wetland vegetation was dominated by obligate species such as common spikerush (*Eleocharis palustris*), ovate spikerush (*Eleocharis ovata*) and Kellogg's sedge (*Carex lenticularis var. lipocarpa*).

The national HGM classification is depressional outflow.

#### E.1.7 Wetland G - PEM/PSS

Wetland G is a 0.09-acre palustrine emergent palustrine scrub shrub wetland that is located along the fringe of a linear drainage ditch that parallels the Chiniak Highway just west of the airport terminal (Figure 5 and 9). It begins inside the study area but continues to the north, off the Airport and outside the study area. A culvert conveys water to the ditch and wetlands at the southwest end of the wetland. Additional water enters from a second culvert under the Chiniak Highway. This channel leaves the study area and flows to the Buskin River.

The boundary of the wetland coincides with a break in vegetation from sedges, rushes, and willow to either gravel with moss and mown alder and spruce or upland grasses and herbs. Data was collected at one plot to determine that this area was a wetland. A paired plot was not possible as we were unable to dig a pit due to compacted gravel material the surface in areas without surface water hydrology and vegetation indicators.

Wetland G is saturated from precipitation and surface water flows from adjacent uplands associated with rainfall events and water flowing through the ditch. The surface topography of the wetland is gently sloping banks and low terraces along a linear drainage that originates at a culvert.

The soils associated with this wetland are mapped by NRCS as Made Land-Kodiak Complex. Field assessment found that texture was a sandy clay loam with gravel at 5 inches. Matrix color

was 10YR 2/2 near the surface. We were unable to dig a pit below 5-inches due to a highly compacted gravel-cobble layer.

The wetland is dominated by obligate plants such as Kellogg's sedge (*Carex lenticularis var. lipocarpa*), a rush with no common name (*Juncus alpinus*) and tufted hair grass (*Deschampsia cespitosa*). Willow (*Salix spp.*) dominates the scrub shrub portion of the wetland.

The national HGM classification is riverine flow-through.

#### E.2 Non-Wetland Waters

There are a number of waterways in the immediate project vicinity (Figure 5). A majority either flow through the study area in natural channels or ditches or are piped through the study area below ground. All of these waterways have been altered by human activity in some way. More information on the hydrology and geomorphology of study area surface waters is found in the Water Resources Technical Memorandum (VAI 2008).

#### E.2.1 Buskin River

The largest of the study area streams is the Buskin River, which drains a watershed that is 25-mi<sup>2</sup> in size. The river originates west of the study area and drains to St. Paul Harbor just north of Runway ends 18 and 25. This river and its riparian buffer generally form the northern boundary of the study area. The mouth of the Buskin River is tidally influenced and includes a small estuary. The Buskin River channel and estuary were altered by the construction and maintenance of the Airport. The river was moved north by man-made fills and the estuary was altered and possibly enlarged by grading and other earthwork, and/or the 1964 earthquake and tsunami.

#### E.2.2 Louise Creek

Louise Creek joins the Buskin River in the project vicinity just north of the study area.

#### E.2.3 Devil's Creek

Devil's Creek begins south of the study area and enters a culvert under Runway 7/25 as it crosses the study area boundary. The creek emerges from the culvert on the north side of the runway and flows above ground for about 100-feet before leaving the study area and flowing to the Buskin River. The Creek has been straightened both upstream and downstream of the culvert and in some places has been lined with wood.

#### E.2.4 Unnamed Stream 1

Unnamed stream network 1 begins west of the study area just west of Runway end 7. This natural drainage network enters a system of ditches and culverts in the study area at the west end of the runway. This constructed drainage parallels the Chiniak Highway beyond the study area boundary and eventually drains to the Buskin River.

# E.2.5 Drury Gulch

Drury Gulch is a small intermittent stream that has been significantly altered. It enters the study area in a below-ground pipe and discharges into St. Paul Harbor at Runway end 25.

#### E.2.6 Unnamed Stream 2

Unnamed stream network 2 that begins on Aviation Hill and flows to the east along the south side of the south taxiway of Runway 7/25. It is within the study area boundary. The streams enter the storm system and are carried to St. Paul Harbor in pipes under the runways.

#### E.2.7 Marine Shoreline

The Airport is located on the shore of St. Paul Harbor in Chiniak Bay and is subject to tidal inundation. Several areas within the study area have lands that are tidally influenced. These include Finny Beach (locally referred to as Jewel Beach), the shore off of Runway ends 36 and 29, and sections of the barrier bar and shore off of Runway ends 25 and 18. Figure 5 illustrates the high tide line in the context of the study area boundary.

### F Deviation from NWI and other sources

Figure 4 shows wetland polygons mapped by the National Wetlands Inventory (NWI) Kodiak Quads C-2 and D-2. The NWI indicates there are several wetlands within the study area and classifies them as follows according to the US Fish and Wildlife Service (Cowardin, et al, 1992):

- PSS1A Palustrine Scrub Shrub\Broad-Leaved\Temporarily Flooded
- R1RBV Riverine\Tidal\Rock Bottom\Permanent Tidal
- R3UBH Riverine\Upper Perennial\Unconsolidated Bottom\Permanently Flooded
- E1UBL Estuarine\Subtidal\ Unconsolidated Bottom\Subtidal
- E2EM1P Estuarine\ Intertidal\Emergent\Persistent\Irregularly Flooded
- M2USS Marine\Intertidal\Unconsolidated Shore\Temporary-Tidal
- M2USN Marine\Intertidal\Unconsolidated Shore\Regularly Exposed

A Wetland Delineation Study of the Coast Guard Integrated Support Command was conducted in 1999 (Dames & Moore). However, this study was limited to the verification of the findings of the NWI and did not identify any wetlands that were not mapped in the NWI.

# **G** Mapping Method

All wetland data plots and wetland boundaries were recorded using a 2005 Trimble GeoXT Global Positioning Systems (GPS). This unit has an inherent horizontal positional accuracy of +/- 3 feet. Following data processing to remove outlying point positions, point features had a minimum horizontal accuracy of +/- 3.0 feet. Line features shown in the figures have a minimum horizontal accuracy of +/- 3.0 feet. Extensive canopy cover prohibited a higher degree of accuracy during data collection, and in some cases field measurements were required to precisely locate data points. Field maps that included high resolution air photo and topographic survey data were used to note the locations of key features observed in the field. These data along with 1-foot survey data and tidal elevation data were used to refine point and boundary locations.

#### **H** Additional Information

# H.1 High Tide Line

The high tide line (HTL) elevation was determined by cross referencing published HTL elevations for Alaska (Corps 2008) with the project area survey and tidal elevations (Table 3). The interpolated HTL elevation, 11.7 feet, appeared slightly high compared to field observations of the upward extent of salt tolerant vegetation. Therefore, for this delineation report, the 11-foot contour line was used to demarcate the boundary. The 8-foot contour was used as the mean high water (MHW) line.

	Table 3. Study Area Tidal Elevatio	ns
	Corps Alaska Tide Data* (feet-MLLW)	Project Survey** (feet-NAVD88)
Extreme High Water (EHW)	13.0	14.0
High Tide Line (HTL)	10.7	
Mean Higher High Water (MHHW)	8.5	9.5
Mean High Water (MHW)	7.6	8.6

#### H.2 Head of Tide

No published data defining the head of tide for the Buskin River was found. Therefore, the location of the head of tide was determined in the field based on observations of changes in stream bed material and channel morphology. Based on these observations the head of tide was determined to be upstream of the old bridge location where the channel transitions from a single channel to a braided channel network (Figure 6). There is no evidence of frequent inundation on the floodplain of the Buskin River between the old bridge and head of tide. Changes in water surface elevation associated with tides are contained within the banks of the active channel through this reach. Wetland B is located in this area. It had dense herbaceous cover and appeared to be inundated primarily by surface water runoff from adjacent land during rainfall events.

# H.3 Drainage Ditches and Culverts

The Storm Water Pollution Prevention Plan (SWPPP) for Kodiak Airport (Shannon & Wilson 2000) was reviewed for this report and provided an understanding of the ditch and pipe drainage network at the airport (Appendix E). This enabled correlation between the receiving waters for various wetlands as well as the source of their hydrology, and aided in the jurisdictional determinations.

# I Results and Conclusions

#### I.1 Waters of the U.S.

Waters of the United States (U.S.) include marine waters and tidal areas below mean high water as well as rivers (below ordinary high water (OHW)), lakes and some wetlands. Marine waters in the project vicinity, below MHW (8 feet), fall under the jurisdiction of the Corps under Section 10 of the Rivers and Harbors Act. This jurisdiction extends to the head of tide which, on the Buskin River, is located just upstream of the old bridge crossing (Figure 6). The shore of St.

Paul Harbor, the Buskin River below head of tide, and the lower elevation areas of Wetland A (6.74 acres) meet these criteria.

The Buskin River above head of tide is not on the Alaska Corps list of navigable waters but this river and its estuary are a fishing destination for fishermen both in the U.S. and abroad. As a source of interstate commerce the river below OHW would be considered a Water of the U.S. The Corps also takes jurisdiction over tributaries to Waters of the U.S. Based on these criteria – and the Corps jurisdiction over marine waters – the Buskin River, Louise Creek, Devil's Creek, Unnamed Stream 1, and Unnamed Stream 2 would all be regulated by the Corps as Waters of the U.S.

#### I.2 Wetlands

Wetlands between MHW (8 feet) and the HTL (11 feet) are regulated as coastal wetlands and fall under the Corps jurisdiction under Section 404 of the Clean Water Act. The upper elevation areas of Wetland A (5.66 acres) meet this criterion.

Section 404 of the Clean Water Act gives the Corps jurisdiction over fresh water wetlands above the OHW line of streams. These wetlands must be connected to waters of the U.S. either by wetlands, surface drainages, or culverts. Of the seven wetlands identified in the study area, all are connected to either the Buskin River or St. Paul Harbor either through channels or pipes. This direct connection supports a jurisdictional determination by the Corps.

Wetlands A and B have the most direct connection. They are located on the floodplain of the Buskin River. Wetland A falls under Corps jurisdiction as a tideland below MHW and as a coastal wetland between MHW and HTL. Wetland B is located on a terrace of the Buskin River. The wetland is occasionally inundated by high river flows. Technically, a small area of this wetland is below HTL but field observations do not support the conclusion that the area is inundated daily by tides.

Wetlands E, F and G are each connected to a ditch system that originated in a natural stream. Water flows from these ditches via culverts to either the Buskin River or St. Paul Harbor. Wetland E and Wetland F are connected to the same ditch. It is fed by flow from Unnamed Stream 2 and drains to St. Paul Harbor. Wetland G is located on the fringe of a straightened ditch that is fed by flow from Unnamed Stream 1. This channel drains to the Buskin River west of the study area.

Wetland C and D are both fed by runoff from the airport infield and are drained by culverts to either the Buskin River or St. Paul Harbor. Wetland C is a small depression on the airport infield that drains to the Buskin River. Wetland D is a small depression that drains to St. Paul Harbor.

#### I.3 Conclusions

Seven jurisdictional wetlands were identified and delineated within the project area as shown in Figure 5 to 7 and summarized in Table 4.

Table 4.	Jurisdictional We	etlands in the Koo	diak Airport EIS S	Study Area
Wetland ID	Dominant Cowardin Class	Acres Within Project area	Sample Plot(s)	HGM Classification
A	E2EM1	9.6 acres	Plot A1-A6	EF,TSW
В	PSS	0.15 acres	Plot B1-B2	D,O
C	PEM	0.25 acres	Plot C1	D,O
D	PEM	0.11 acres	Plot D1-D2	D,O
E	PEM	0.22 acres	Plot E1-E2	R,FT
F	PEM	0.05 acres	Plot F1	D,O
G	PEM/PSS	0.09 acres	Plot G1	R,FT

<sup>1.</sup> Cowardin Wetland Classification: E2EM = Estuarine intertidal persistent emergent, PEM = Palustrine Emergent Wetland, PSS = Palustrine Scrub-Shrub;

# J Disclaimer

This report documents the investigation, best professional judgment, and conclusions of the investigators. It should be considered a **Preliminary Jurisdictional Determination** until it has been approved in writing by the Corps of Engineers.

<sup>2.</sup> Brinson Hydrogeomorphic Classification: D = Depressional, R = Riverine, EF = Estuary Fringe; Subclass: F = Flow-through, O = Outflow, TSW = Tidal Salt Water

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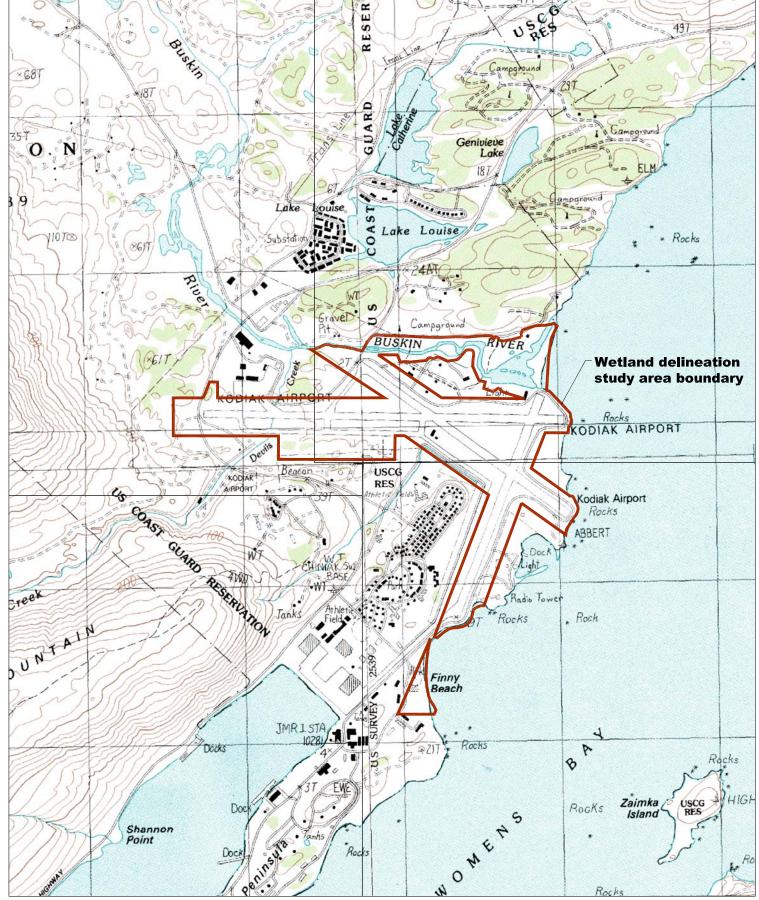
#### Kodiak Airport EIS – Wetland Delineation Report

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# **Appendices**

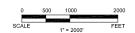
Kodiak Airport EIS – Wetland Delineation Report

Appendix A: Figures



Source: USGS topo quad: Kodiak C-2 NE & NW, D-2 SE & SW, 1987

FIGURE 1. Vicinity Map





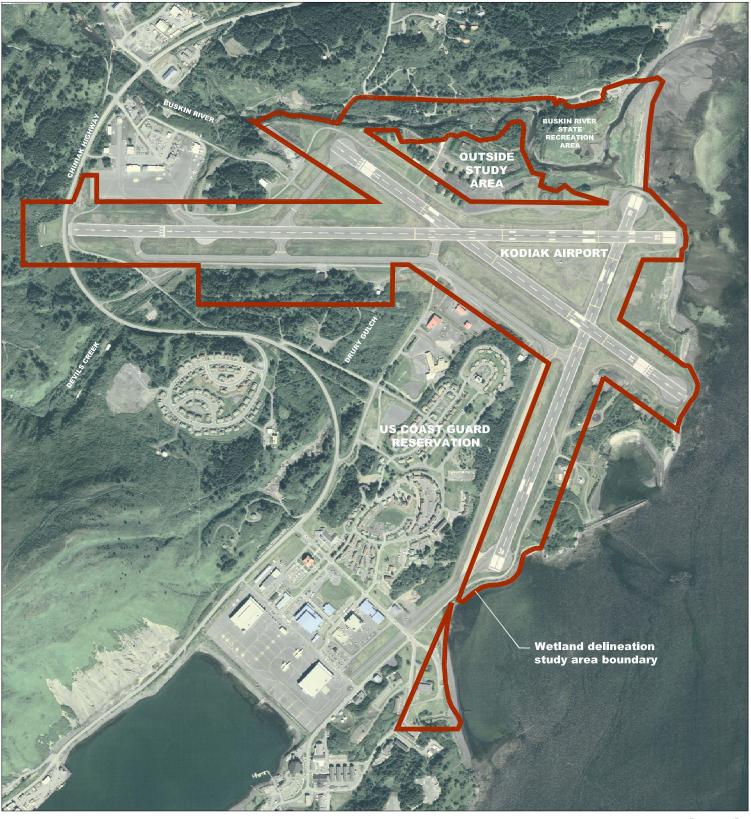
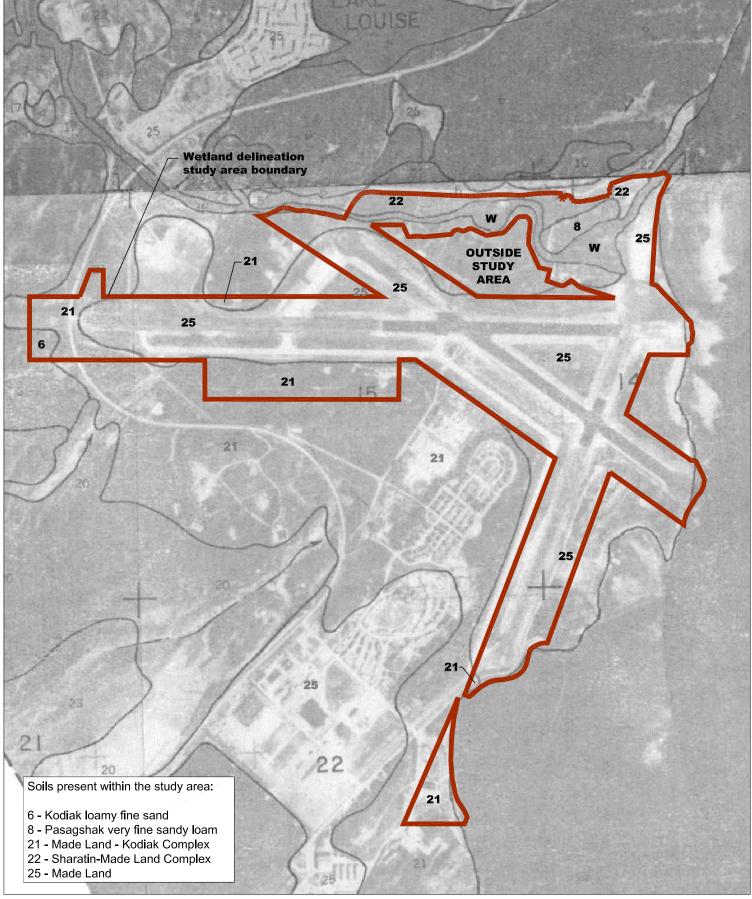






FIGURE 2. 2004 Aerial Photograph

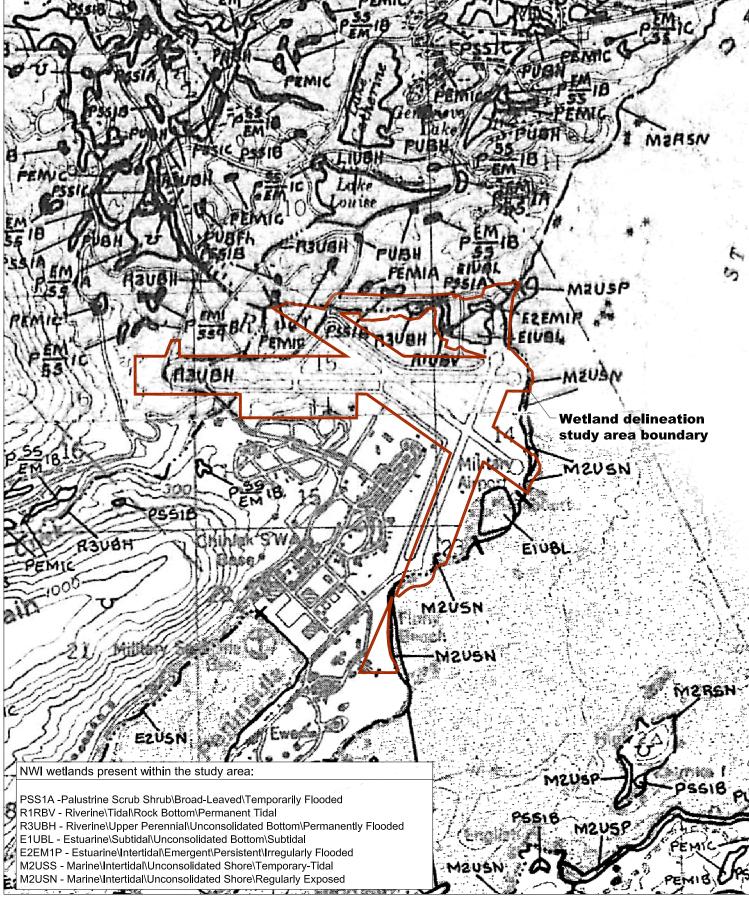


Source: USDA SCS Soil Survey for U.S Coast Guard Reservation, 1980

0 300 600 1200 SCALE 1" = 1200' FEET



FIGURE 3. Soils

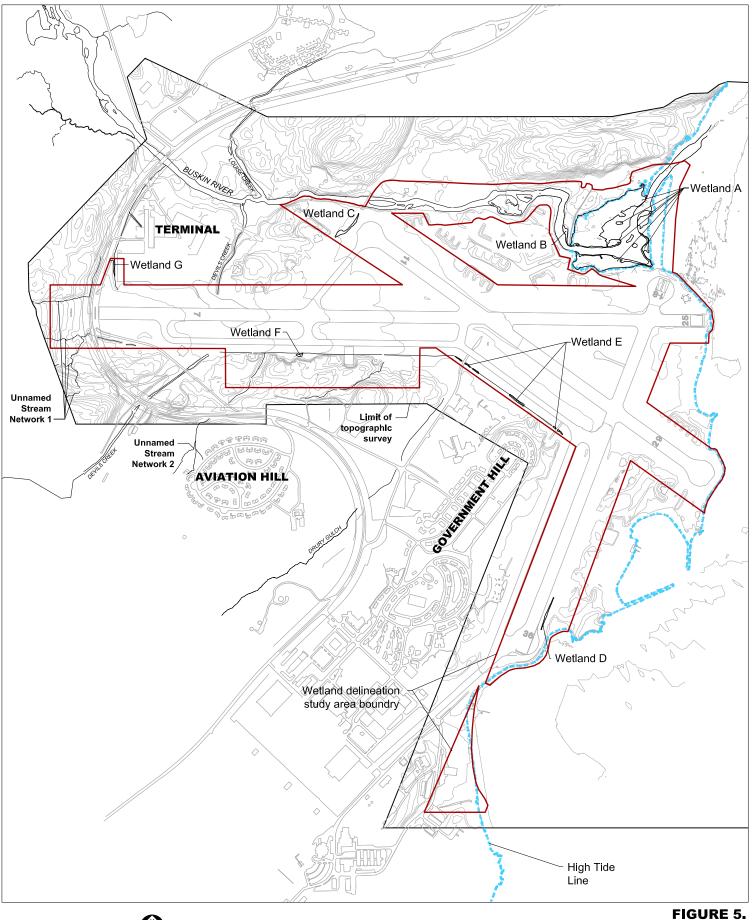


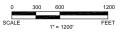
Source: NWI quad: Kodiak C-2 & D-2, 1988

FIGURE 4. National Wetlands Inventory





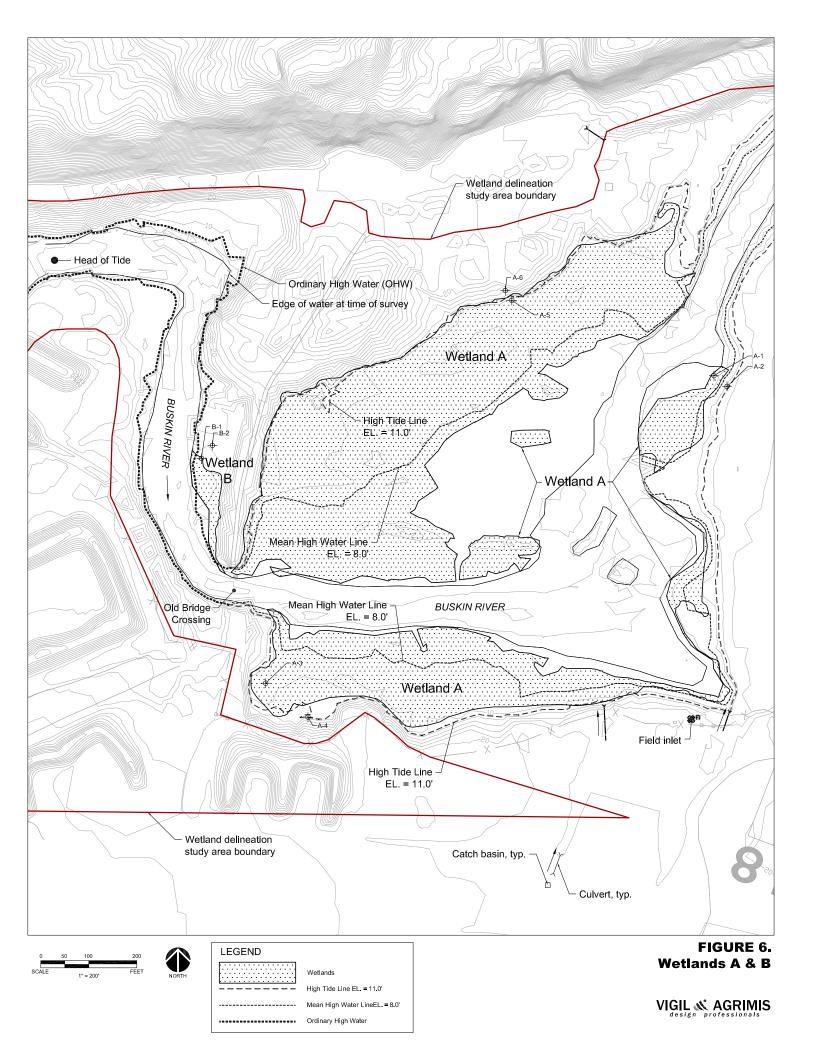


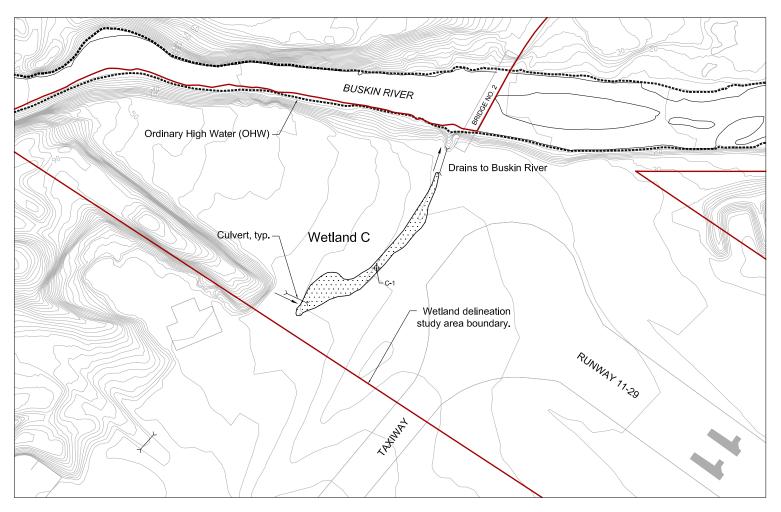


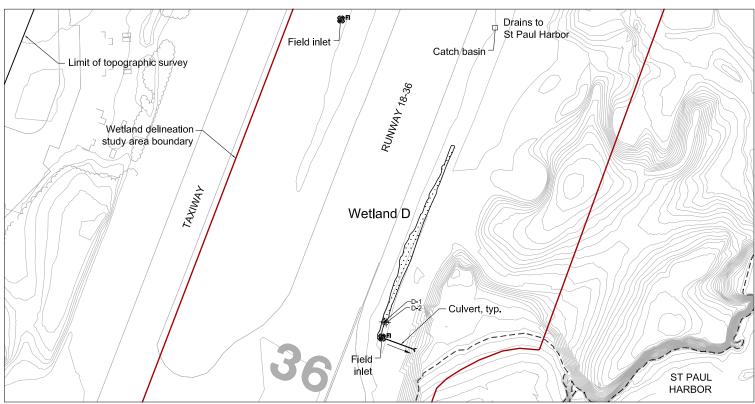


Overview of Delineated Wetlands

& Non-wetland Waters











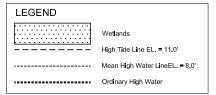
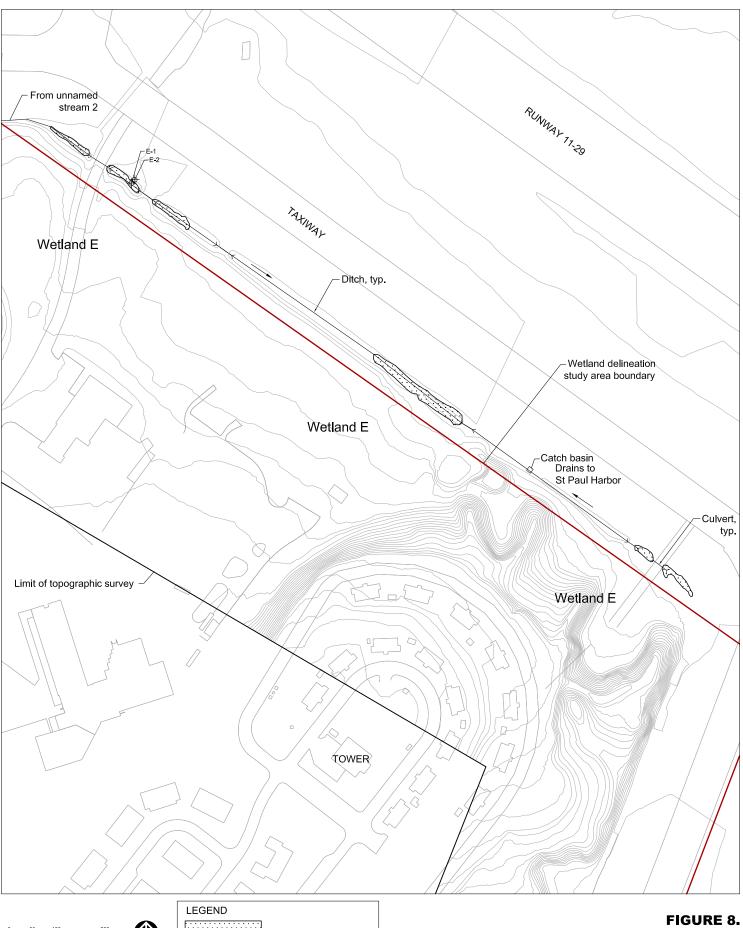


FIGURE 7. Wetlands C & D

VIGIL AGRIMIS





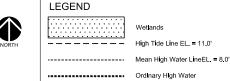
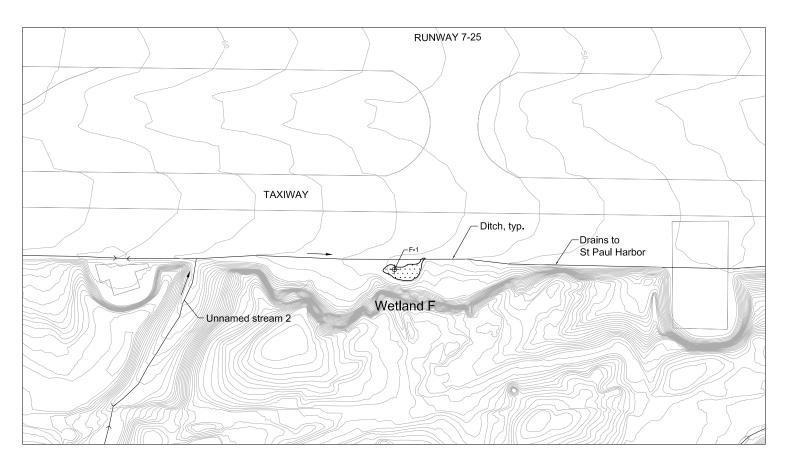


FIGURE 8. Wetland E

VIGIL AGRIMIS



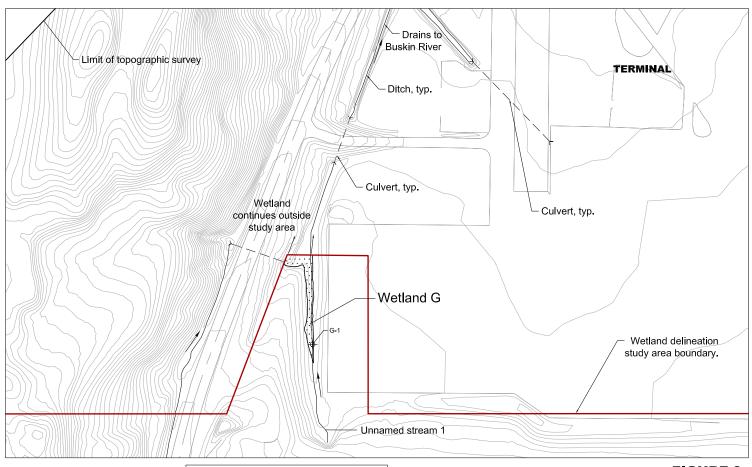








FIGURE 9. Wetlands F & G

VIGIL & AGRIMIS

Kodiak Airport EIS – Wetland Delineation Report

Appendix B: WETS Station Data

#### Kodiak Airport EIS – Wetland Delineation

WETS Station: KITOI BAY, AK4812 Creation Date: Latitude: 5811 Longitude: 15221 Elevation: 00010 State FIPS/County(FIPS): 02150 County Name: Kodiak WETS Station : KITOI BAY, AK4812 Creation Date: 08/25/1999

Start yr. - 1961 End yr. - 1990

		Temperatu (Degrees			_	itation ches)		
			     		30% ch		avg    # of   days	avg total
Month	avg   daily   max	avg     daily     min	avg     	avg	less   than 	more   than	w/.1    or   more	snow fall
January	33.5	   23.8	28.6	6.38	4.12	   7.68	14	15.2
February	34.4	23.6	29.0	4.86	3.21	5.83	11	14.9
March	38.1	25.4	31.7	4.47	2.98	5.35	11	9.7
April	42.4	29.4	35.9	4.49	3.45	5.22	11	4.6
May	48.7	35.9	42.3	5.37	3.86	6.34	12	0.5
June	54.5	42.5	48.5	4.43	3.17	5.24	9	0.0
July	60.3	47.5	53.9	3.38	2.40	4.01	8	0.0
August	61.2	47.7	54.5	5.20	3.44	6.24	10	0.0
September	54.9	42.9	48.9	6.73	5.50	7.65	12	0.0
October	44.9	33.2	39.0	6.36	4.97	7.35	11	1.5
November	37.1	27.5	32.3	5.48	3.68	6.55	11	5.2
December	33.9	24.0	29.0	6.12	3.83	7.39	13	11.8
Annual					51.48	67.59	i i	
Average	45.3		39.5				i i	
Total		 		63.28		 	  133	63.4

GROWING SEASON DATES

	Temperature
Probability	   24 F or higher   28 F or higher   32 F or higher   
	Beginning and Ending Dates
	Growing Season Length
50 percent *	4/13 to 10/24   5/ 5 to 10/ 9   5/23 to 9/28   194 days   157 days   128 days
70 percent *	4/ 3 to 11/ 3   4/26 to 10/17   5/17 to 10/ 4   214 days   174 days   140 days

<sup>\*</sup> Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1955-1999 prcp

# Kodiak Airport EIS – Wetland Delineation

Station : AK4812, KITOI BAY
----- Unit = inches

yr jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
55M6.57	3.69	4.58	2.94	10.45	5.20	4.60	3.66	3.95	8.08	5.70	1.86	61.28
56 2.08		4.65	4.03	8.12	2.27	3.82	5.85				M3.79	
57 2.58		7.14	5.38	3.56	0.61		M5.63			7.58		62.71
58 9.67		M4.62				M8.69		4.34	4.03	4.90		71.47
59M7.16		M4.69	4.07	3.52		5.40	2.92	4.88			M5.39	
60 8.10			M4.90	4.18	4.65		M5.19			6.13		72.20
61M7.80				M5.33				M2.53			M3.65	
62M4.96	1.44	M3.58	3.84	4.75	1.90		M1.30	6.20	5.43	6.44	7.57	47.41
63 6.86	5.04	2.09		2.31	2.97	1.55	4.86	5.50	5.59	3.59	9.91	54.37
64M7.64	M6.32				M0.10	1.27	5.34	3.02	4.64		4.33	37.13
65 5.73	3.37	5.19	3.45	3.85	6.63	3.06	1.50	9.55	6.66	7.07	3.63	59.69
66 7.74	1.63	4.76	3.64	2.61	3.29	3.59	7.84	8.16	8.43	2.56	4.16	58.41
67 2.83	4.57	1.64	3.50	1.75	4.13	1.33	12.41	7.86	4.53	4.99	4.99	54.53
68 1.88	6.76	4.13	4.88	4.28	2.76	3.13	5.24	5.26	4.63	8.18	4.71	55.84
69 1.26	M3.77	5.66	7.06	6.54	6.00	2.54	3.99	8.09	11.53	5.39	10.65	72.48
70 3.50	8.57	7.87	1.71	3.84	1.75	5.00	7.10	5.39	4.92	2.90	4.90	57.45
71 3.86	7.92	4.41	M4.90	13.02	5.59	8.22	4.21	7.21	7.27	3.79	M5.11	75.51
72 3.35	4.26	0.58	1.48	7.58	4.45	2.53	11.30	5.59	6.08	7.59	1.87	56.66
73 3.36	3.97	3.38	M4.39	8.84	2.14	3.56	3.14	6.20	M5.15	1.01	6.00	51.14
74 5.18	M3.60	3.35	5.64	4.51	3.67	1.78	5.63	7.87	10.74	5.65	1.44	59.06
75 3.65	3.90	3.06	4.40	8.39	4.65	2.15	M3.33	M6.68	6.29		M4.95	
76 5.53	1.86	1.45	4.13	3.76	3.41	3.46	9.23	11.42	4.04	12.84	M8.27	69.40
7713.36	9.99	3.04	5.74	5.43	3.86	1.32	M8.24	3.11	9.72	1.46	1.59	66.86
78 4.26	4.72	3.12	5.22	8.72	2.01	3.56	4.18	6.15	9.81			63.81
79 5.62	0.69	6.14	3.46	5.63	4.55	3.84	6.06	8.49	8.31		M2.42	
80 4.78	8.99	6.36	8.01	7.86	3.87	2.28	3.51	8.21	11.30	8.75	4.84	78.76
8115.93	7.11	9.23	4.90	5.67	3.76	4.07	5.11	5.91	4.36	8.08	M5.75	79.88
82 6.80	3.60	3.25	M5.20	6.59	6.31	4.45	1.87	8.50	2.17	4.99	11.58	65.31
83M7.25	6.43	5.44	M3.58	9.55	4.95	2.65	1.52	3.96	5.44	13.00	2.56	66.33
84 7.70	M5.78	8.67	6.13	3.97	5.77	2.24	3.41	6.26	3.34	6.55	4.40	64.22
8513.68	2.54	5.56	6.19	2.68	5.05	7.48	3.70	5.37	4.73		17.41	
8610.60	5.39	2.87	2.24	2.66	9.31	3.17	7.76	4.29	7.94	6.59	12.33	75.15
8712.03	4.76	7.26	5.39		13.28	2.69	2.15	8.23	5.72	5.18		73.65
88 7.31	8.83	7.60	6.63	3.13	2.24	2.63	6.40	4.42	7.05		10.35	
89 2.76	M2.38	2.50	4.99	3.07	4.52	5.45	7.63	8.01	5.98	M3.98		60.17
90 5.44	2.66	3.81	3.98	4.68	3.02	5.77	5.94	10.32	3.88	1.91		55.63
91 3.58	8.08	1.51	9.82	9.67	6.73	2.54	3.67	8.01	5.20	11.90		
92 7.12	3.04	5.86	3.31	3.20	4.91	4.96	8.02	1.45	3.80	4.39		54.88
93M3.00	5.92	6.56	7.81	5.87	1.58	2.06	9.38	4.29	7.70		10.17	
94 9.39	4.68	6.04	6.69	7.84	2.96	7.57	1.32	7.78	12.14	3.04		77.54
95 7.88	5.95	2.82	6.90		4.84	4.57	5.54		10.55	2.09		59.96
96M2.93	3.16	2.84	8.34	1.81	5.67	3.79	3.43	7.28	3.54	3.92		54.21
9711.40	8.90	M1.86	5.81	2.34	1.13	2.32		10.30	5.11	M5.41	M7.51	
98 9.29		7.62	7.16	7.29	6.54	5.20	4.50	7.06			4.77	59.43
99												

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Kodiak Airport EIS – Wetland Delineation Report

Appendix C: Data Forms

# WETLAND DETERMINATION DATA FORM – Alaska Region

Applicant/Owner: Alaska Department of Transport		ato i locioal	ion Area	Borough/City: Koo	JICH ISICHIU	Sampling L	Jale. J. II.
Investigator(s): M. Raad, T Johnson, R. Ruggie							
Local relief (concave, convex, none): none							1100
Subregion: Southcentral Alaska						Datum:	
Are climatic / hydrologic conditions on the site ty							
Are Vegetation, Soil, or Hydrolog							
Are Vegetation, Soil, or Hydrolog							No
				eeded, explain any		*	
SUMMARY OF FINDINGS - Attach s	ite map showing	samplir	ng point	locations, tran	sects, imp	ortant featu	ıres, etc
Hydrophytic Vegetation Present? Yes	X No						
	X No		ne Sample				
	X No	With	nin a Wetla	nd?	Yes X	No	_
Remarks:							
VEGETATION							
TECETATION	*	Absolute	Indicator	1			
Species (Use scientific names. List all species	in plot.)	% Cover	Indicator Status	Prevalence Inde	ex:		
1. Carex limosa		TR	OBL	Total % Cov	/er of:	Multiply by	
2. Carex lyngbyei		50%	OBL	OBL species			
3. Cochlearia officinalis		10%	FACW	FACW species			
		10%	OBL	FAC species		x 3 =	
5. Puccinellia phryganodes		TR	OBL	FACU species		_ x 4 =	
7		15%	OBL	UPL species		x 5 =	
7. <u>Spergularia canadensis</u>		7%	FACW	Column Totals:	82	(A) <u>89</u>	(B)
8. <u>Triglochin maritimum</u>		TR	OBL	Prevalence	Index = B/A	= _1.21	
				1 Tevalerice	illuex - D/A	1.21	
9							
10				( Sector   10   10	-21111		
10				Other Indicators			
10				Other Indicators (Record supporti sheet.)			
10				(Record supporti	ng data in Re	marks or on a s	eparate
10				(Record supporti sheet.)	ng data in Re	marks or on a s	eparate
10				(Record supporti sheet.)  Wetland Cry	ng data in Re	marks or on a s	eparate
10				(Record supporting sheet.)  Wetland Cry at left)  Morphologics	ng data in Reproperties	marks or on a s	eparate cover
10				(Record supporting sheet.)  Wetland Cry at left)  Morphologics	ng data in Reproperties	marks or on a s ord species and	eparate cover
10				(Record supporting sheet.)  Wetland Cry at left)  Morphologics	ng data in Reproperties	marks or on a s ord species and	eparate cover
10				(Record supporting sheet.)  Wetland Cry at left)  Morphologics	ng data in Reproperties	marks or on a s ord species and	eparate cover
10				(Record supporting sheet.)  Wetland Cryon at left)  Morphologication  Problematic	ng data in Reproperties	marks or on a s ord species and	eparate cover
10	Total Cover:	50%		(Record supporting sheet.)  Wetland Cry at left)  Morphologication Problematic	ng data in Reproperties	marks or on a s ord species and	eparate cover
10		50%		(Record supporting sheet.)  Wetland Cryon at left)  Morphologication  Problematic	ng data in Re ptogams (rec al Adaptations Hydrophytic \	marks or on a s ord species and	eparate cover ain)

Sampling Point: A-1

Depth	Matrix			x Features				
(inches) Col	lor (moist)	% C	color (moist)	%	Type <sup>1</sup>	_Loc <sup>2</sup>	Texture	Remarks
0-4" 2.5Y	′ 3/1			-			Sandy	
4-7" Gley	1 7/10Y						Sandy	some organics at bottom
7-16" Gley	1 2.5 N	7.5	5 YR 3/4	7%	_C	PL M	Sandy	redox in top 3"
Type: C=Concentra ydric Soil Indicate	THE RESERVE OF THE PARTY OF THE		uced Matrix. ndicators for F				C=Root Chan	nel, M=Matrix.
Histosol or Histo		"	Alaska Cold		OH CHELLINGS	Solls .	Allerdo	01
The state of the s		× -						a Gleyed Without Hue 5Y or Redder
_ Histic Epipedon	30	-	Alaska Alpir					erlying Layer
_ Hydrogen Sulfid			X Alaska Red	iox with 2.5	by Hue		Other	(Explain in Remarks)
_ Thick Dark Surfa		3,	o				a	
X Alaska Gleyed (		2						or of wetland hydrology,
_ Alaska Redox (A		4.	and an approp				be present.	
_ Alaska Gleyed F		7(	Give details of o	color chang	ge in Rem	narks.		
estrictive Layer (if	f present):							
Type:								
Type: Depth (inches): _							Hydric Soil	Present? Yes X No
Type: Depth (inches): _ Remarks:							Hydric Soil	Present? Yes X No
Type: Depth (inches): _ Remarks:					•			
Type: Depth (inches): _ Remarks:  COROLOGY Vetland Hydrology	Indicators:				-		Secondary	Indicators (2 or more required)
Type: Depth (inches): _ Remarks:  POROLOGY  Vetland Hydrology rimary Indicators (a	Indicators:	s sufficient)					Secondary  Water-	Indicators (2 or more required) stained Leaves (B9)
Type: Depth (inches): _ demarks:  POROLOGY  Vetland Hydrology rimary Indicators (a _ Surface Water (A)	Indicators: any one indicator is	s sufficient) X So	urface Soil Crad				Secondary Water Draina	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10)
Type: Depth (inches): _ demarks:  POROLOGY  Vetland Hydrology rimary Indicators (a _ Surface Water (A _ High Water Table	Indicators: any one indicator is	s sufficient) <u>X</u> Su	undation Visible	e on Aerial		W	Secondary  Water Draina X Oxidiz	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3
Type: Depth (inches): _ demarks:  PROLOGY  Vetland Hydrology rimary Indicators (a Surface Water (/ High Water Tabl ( Saturation (A3))	Indicators: any one indicator is A1) e (A2)	s sufficient) <u>X</u> Si — Ini — Sp	undation Visible parsely Vegetat	e on Aerial ted Concav	e Surface	W	Secondary  Water- Draina X Oxidiz Preser	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3
Type: Depth (inches): demarks:  PROLOGY  Vetland Hydrology rimary Indicators (a Surface Water (/ High Water Tabl ( Saturation (A3) Water Marks (B1)	Indicators: iny one indicator is A1) e (A2)	s sufficient)  X Si Ini Sp Hy	undation Visible parsely Vegetat ydrogen Sulfide	e on Aerial ted Concav Odor (C1)	ve Surface	W	Secondary  Water- Draina X Oxidiz Preser Salt De	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5)
Type: Depth (inches): demarks:  PROLOGY  Vetland Hydrology rimary Indicators (a Surface Water (A High Water Tabl ( Saturation (A3) Water Marks (B1) ( Sediment Depos	Indicators: iny one indicator is A1) e (A2) f) sits (B2)	s sufficient) <u>X</u> Si — Ini — Sp — Hy — Dr	undation Visible parsely Vegetat ydrogen Sulfide ry-Season Wate	e on Aerial ted Concav Odor (C1) er Table (C	ve Surface ) (2)	W	Secondary Water- Draina X Oxidiz Preser Salt Do Stunte	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1)
Type:	Indicators: any one indicator is A1) e (A2) f) sits (B2)	s sufficient)  X Su Inu Su	undation Visible parsely Vegetat ydrogen Sulfide	e on Aerial ted Concav Odor (C1) er Table (C	ve Surface ) (2)	W	Secondary  Water- Draina X Oxidiz  Preser Salt De Stunte X Geom	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2)
Type:	Indicators: uny one indicator is A1) e (A2) f) sits (B2) 3) Algae or Marl (B4)	s sufficient)  X Su Inu Su	undation Visible parsely Vegetat ydrogen Sulfide ry-Season Wate	e on Aerial ted Concav Odor (C1) er Table (C	ve Surface ) (2)	W	Secondary  Water- Draina X Oxidiz Preser Salt De Stunte X Geom-	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3)
Type:	Indicators: uny one indicator is A1) e (A2) f) sits (B2) 3) Algae or Marl (B4)	s sufficient)  X Su Inu Su	undation Visible parsely Vegetat ydrogen Sulfide ry-Season Wate	e on Aerial ted Concav Odor (C1) er Table (C	ve Surface ) (2)	W	Secondary  Water- Draina X Oxidiz Preser Salt De Stunte X Geom Shallon Microto	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4)
Type:	Indicators: any one indicator is A1) e (A2) f) sits (B2) 3) Algae or Marl (B4)	s sufficient)  X Su Inu Su	undation Visible parsely Vegetat ydrogen Sulfide ry-Season Wate	e on Aerial ted Concav Odor (C1) er Table (C	ve Surface ) (2)	W	Secondary  Water- Draina X Oxidiz Preser Salt De Stunte X Geom Shallon Microto	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3)
Type:	Indicators: any one indicator is A1) e (A2) f) sits (B2) 3) Algae or Marl (B4)	s sufficient)  X Si Ini Sp Hy Z Or	undation Visible parsely Vegetat ydrogen Sulfide ry-Season Wate ther (Explain in	e on Aerial ded Concav de Odor (C1) er Table (C Remarks)	ve Surface ) (22)	e (B8)	Secondary  Water- Draina X Oxidiz Preser Salt De Stunte X Geom Shallon Microto	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4)
Type:	Indicators: uny one indicator is A1) e (A2) f) sits (B2) 3) Algae or Marl (B4) 5) nt? Yes	s sufficient)  X Si  Ini Sp  Hy  Z Of	undation Visible parsely Vegetat ydrogen Sulfide ry-Season Wate ther (Explain in	e on Aerial ded Concav e Odor (C1) er Table (C Remarks)	ve Surface ) (22)	e (B8)	Secondary  Water- Draina X Oxidiz Preser Salt De Stunte X Geom Shallon Microto	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4)
Type:	Indicators:  Iny one indicator is  A1) e (A2)  () sits (B2) 3)  Algae or Marl (B4)  5)  nt? Yes ? Yes	s sufficient)  X Si  Ini  Sp  Hy  X Of	undation Visible parsely Vegetat ydrogen Sulfide ry-Season Wate ther (Explain in  X Depth (inc	e on Aerial ded Concav de Odor (C1) er Table (C Remarks)	ve Surface ) :2)	e (B8)	Secondary  Water- Draina X Oxidiz Preser Salt De Stunte X Geom Shallon Microto	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4)
Type:	Indicators:  Iny one indicator is  A1) e (A2)  () sits (B2) 3) Algae or Marl (B4) 5)  nt? Yes ? Yes nge)	s sufficient)  X Si  Ini  Sp  Hy  Z Of	undation Visible parsely Vegetat ydrogen Sulfide ry-Season Wate ther (Explain in  X Depth (inc  Depth (inc	e on Aerial ted Concav Odor (C1) er Table (C Remarks)	ve Surface ) (22)	e (B8)	Secondary  Water- Draina X Oxidiz Preser Salt Do Stunte X Geom Shallor Hicroto FAC-N	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4)
Type:	Indicators:  Iny one indicator is  A1) e (A2)  () sits (B2) 3) Algae or Marl (B4) 5)  nt? Yes ? Yes nge)	s sufficient)  X Si  Ini  Sp  Hy  Z Of	undation Visible parsely Vegetat ydrogen Sulfide ry-Season Wate ther (Explain in  X Depth (inc  Depth (inc	e on Aerial ted Concav Odor (C1) er Table (C Remarks)	ve Surface ) (22)	e (B8)	Secondary  Water- Draina X Oxidiz Preser Salt Do Stunte X Geom Shallor Hicroto FAC-N	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) eutral Test (D5)
Type:	Indicators:  Iny one indicator is  A1) e (A2)  () sits (B2) 3) Algae or Marl (B4) 5)  nt? Yes ? Yes nge)	s sufficient)  X Si  Ini  Sp  Hy  Z Of	undation Visible parsely Vegetat ydrogen Sulfide ry-Season Wate ther (Explain in  X Depth (inc  Depth (inc	e on Aerial ted Concav Odor (C1) er Table (C Remarks)	ve Surface ) (22)	e (B8)	Secondary  Water- Draina X Oxidiz Preser Salt Do Stunte X Geom Shallor Hicroto FAC-N	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) eutral Test (D5)
Type:	Indicators: Inly one indicator is A1) e (A2) I) sits (B2) 3) Algae or Marl (B4) 5) nt? Yes ? Yes yes nge) Data (stream gaug	s sufficient)  X St  Int  St  Hy  Dr  X Of  X No  E, monitorin	undation Visible parsely Vegetat ydrogen Sulfide ry-Season Wate ther (Explain in  X Depth (inc  Depth (inc	e on Aerial fed Concav Odor (C1) er Table (C Remarks) ches): ches): ches): ches):	ve Surface ) (22)	e (B8)	Secondary  Water- Draina X Oxidiz Preser Salt Do Stunte X Geom Shallor Hicroto FAC-N	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) eutral Test (D5)
Type:	Indicators: Inly one indicator is A1) e (A2) I) sits (B2) 3) Algae or Marl (B4) 5) nt? Yes ? Yes yes nge) Data (stream gaug	s sufficient)  X St  Int  St  Hy  Dr  X Of  X No  E, monitorin	undation Visible parsely Vegetat ydrogen Sulfide ry-Season Wate ther (Explain in  X Depth (inc  Depth (inc	e on Aerial fed Concav Odor (C1) er Table (C Remarks) ches): ches): ches): ches):	ve Surface ) (22)	e (B8)	Secondary  Water- Draina X Oxidiz Preser Salt Do Stunte X Geom Shallor Hicroto FAC-N	Indicators (2 or more required) stained Leaves (B9) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 nce of Reduced Iron (C4) eposits (C5) d or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) eutral Test (D5)

Applicant/Owner: Alaska Department of T					
nvestigator(s): M. Raad, T Johnson, R. F					nmocks, etc.):Dune
ocal relief (concave, convex, none): none					
ubregion: Southcentral Alaska					
re climatic / hydrologic conditions on the	site typical for this time	e of year? Yes_	X No	(If no, explain in Remai	rks.)
re Vegetation, Soil, or Hy					
re Vegetation, Soil, or Hy	ydrology natura	ally problematic?	(If n	needed, explain any answers in	Remarks.)
UMMARY OF FINDINGS - Att					
Hydrophytic Vegetation Present?	Yes No>				,
Hydric Soil Present?	Yes No	/ 15	the Sample		
Wetland Hydrology Present?	Yes No>		thin a Wetla	and? Yes	No <u>X</u>
TOTATION:					
EGETATION					
Species (Use scientific names. List all sp	pecies in plot.)	Absolute % Cover	Indicator Status	Prevalence Index:	
A 1		(AVEX)()	FAC	Total % Cover of:	Multiply by:
			FAC	OBL species	
. Epilobium angustifolium		15%	FACU	FACW species	
. Picea sitchensis			FACU	FAC species 85	
·				FACU species15	
				UPL species Column Totals: 100	x 5 =(β)
,				Prevalence Index = B/A	
0					
1,				Other Indicators of Hydroph	ytic Vegetation:
2				(Record supporting data in Resheet.)	
3 4				Wetland Cryptogams (red	ord species and cover
45			-	at left)	ord species and cover
3				Morphological Adaptation	S
7				Problematic Hydrophytic	
3.					
9					
)					
	Total C	over:100%		Hydrophytic	
ot size <u>9-meter radius</u>	% Bare Gr	ound <u>0%</u>		Vegetation	20
Cover of Wetland Bryophytes	Total Cover of E	Bryophytes		Present? Yes	NoX
emarks:					

	atrix	Redox Featu		-
(inches) Color (mo	oist) %	Color (moist) %	Type <sup>1</sup> Loc <sup>2</sup>	Texture Remarks
0-16" Gley 1 2.5	N	No		Coarse sand; medium 2-5mm w/?
T O O		2		
Type: C=Concentration, D Hydric Soil Indicators:	D=Depletion, Ri	Indicators for Problem		RC=Root Channel, M=Matrix.
Histosol or Histel (A1)		Alaska Color Chan	CAROLINA PROPERTY AND ADDRESS OF THE PARTY O	Alcoko Gloved Without Hus EV or Bodden
Histic Epipedon (A2)		Alaska Alpine Swal		Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
<ul><li>Hydrogen Sulfide (A4)</li><li>Thick Dark Surface (A1)</li></ul>	10)	_ Alaska Redox With	Z.31 Flue	Other (Explain in Remarks)
_ Alaska Gleyed (A13)	12)	<sup>3</sup> One indicator of bydror	abutio vocatation and	e primary indicator of wetland hydrology,
Alaska Redox (A14)				
Alaska Gleyed Pores (A	A4E)	and an appropriate la <sup>4</sup> Give details of color ch	2 2	st be present.
estrictive Layer (if prese	-1.00	Give details of color cri	ange in hemarks.	
estrictive Laver III brese	ent).			
Type:				N. 1. 6 N. 6 N. 6 N. 10 N. 11
				Hydric Soil Present? Yes No _X_
Type:				Hydric Soil Present? Yes No _X
Type: Depth (inches): Remarks: Soil" color is that of parent	gravel materia			Hydric Soil Present? Yes No _X
Type: Depth (inches): Remarks: Soil" color is that of parent	gravel materia			Hydric Soil Present? Yes No _X
Type: Depth (inches): Remarks: Soil" color is that of parent  YDROLOGY Vetland Hydrology Indica	gravel materia			
Type: Depth (inches): Remarks: Soil" color is that of parent  YDROLOGY Vetland Hydrology Indica	gravel materia			Secondary Indicators (2 or more required)
Type:	gravel materia	ficient)		Secondary Indicators (2 or more required)  Water-stained Leaves (B9)
Type:	gravel materia	ficient) Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con	rial Imagery (B7) cave Surface (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)
Type:	gravel materia	ficient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor (	rial Imagery (B7) cave Surface (B8) C1)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3
Type:	gravel materia	ficient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor ( Dry-Season Water Table	rial Imagery (B7) cave Surface (B8) C1) e (C2)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)
Type:	gravel materia	ficient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor (	rial Imagery (B7) cave Surface (B8) C1) e (C2)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Type:	gravel materia	ficient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor ( Dry-Season Water Table	rial Imagery (B7) cave Surface (B8) C1) e (C2)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Type:	gravel materia	ficient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor ( Dry-Season Water Table	rial Imagery (B7) cave Surface (B8) C1) e (C2)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Type:	gravel materia	ficient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor ( Dry-Season Water Table	rial Imagery (B7) cave Surface (B8) C1) e (C2)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Type:	gravel materia  ators: e indicator is su  c) r Marl (B4)	ficient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor ( Dry-Season Water Table Other (Explain in Remark	rial Imagery (B7) cave Surface (B8) C1) e (C2) ss)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Type:	gravel materia  ators: e indicator is su  ?) r Marl (B4)	ficient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor ( Dry-Season Water Table Other (Explain in Remark	rial Imagery (B7) cave Surface (B8) C1) e (C2) cs)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Type:	gravel materia  ators: e indicator is su  ators: e indicator is su  Yes Yes	ficient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor ( Dry-Season Water Table Other (Explain in Remark	rial Imagery (B7) cave Surface (B8) C1) e (C2) cs)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Type:	gravel materia  ators: e indicator is su  t)  Yes Yes Yes Yes	ificient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor ( Dry-Season Water Table Other (Explain in Remark  No X Depth (inches): No X Depth (inches):	rial Imagery (B7) cave Surface (B8) C1) e (C2) cs) Wet	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Type:	gravel materia  ators: e indicator is su  t)  Yes Yes Yes Yes	ficient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor ( Dry-Season Water Table Other (Explain in Remark	rial Imagery (B7) cave Surface (B8) C1) e (C2) cs) Wet	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Type:	gravel materia  ators: e indicator is su  t)  Yes Yes Yes Yes	ificient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor ( Dry-Season Water Table Other (Explain in Remark  No X Depth (inches): No X Depth (inches):	rial Imagery (B7) cave Surface (B8) C1) e (C2) cs) Wet	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Type:	gravel materia  ators: e indicator is su  to Marl (B4)  Yes Yes Yes tream gauge, m	ificient)  Surface Soil Cracks (B6) Inundation Visible on Ae Sparsely Vegetated Con Hydrogen Sulfide Odor ( Dry-Season Water Table Other (Explain in Remark  No X Depth (inches): No X Depth (inches):	rial Imagery (B7) cave Surface (B8) C1) e (C2) cs)  Wet previous inspections)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. S	State Recreat	ion Area	Borough/City: Kodiak Island Sampling Date: 9.11.0
Applicant/Owner: Alaska Department of Transportation / Federal Avid	ation Adminis		
Investigator(s): M. Raad, T Johnson, R. Ruggiero			
Local relief (concave, convex, none): none			
Subregion: Southcentral Alaska Lat:			
Are climatic / hydrologic conditions on the site typical for this time of			
Are Vegetation, Soil, or Hydrology significant			
Are Vegetation, Soil, or Hydrology naturally p			
SUMMARY OF FINDINGS – Attach site map showin			
Hydrophytic Vegetation Present? Yes X No	1- 4	h - C 1	4.4
Hydric Soil Present? Yes X No	IS L	he Sample hin a Wetla	
Wetland Hydrology Present? Yes X No	- WILI	iiii a vvetia	nd? Yes X No
Remarks:  Rusting barrels upslope may be source of rust coloring in soils.			
VEGETATION			
	Absolute	Indicator	
Species (Use scientific names. List all species in plot.)	% Cover		Prevalence Index:
1. <u>Calamagrostis canadensis</u>	15%	FAC	Total % Cover of: Multiply by:
2. Elymus mollis		FAC	OBL species x 1 =
3. Rumex obtusifolius			FACW species x 2 =
4			FAC species x 3 = x 3 =
5			FACU species x 4 =
7			UPL species x 5 = Column Totals: (A) (B)
8			Prevalence Index = B/A = 3.00
9			
10			
11.			Other Indicators of Hydrophytic Vegetation:
12.			(Record supporting data in Remarks or on a separate
13			sheet.) Wetland Cryptogams (record species and cover
14 15			at left)
16.			Morphological Adaptations
17			Problematic Hydrophytic Vegetation (Explain)
18			
19			
20			
Total Cove	r: <u>100%</u>		N. A. S.
Plot size	d0%		Hydrophytic Vegetation
% Cover of Wetland Bryophytes Total Cover of Bryo			Present? Yes X No No
Remarks:	· · · · · · · · · · · · · · · · · · ·		

		oth needed to document the	mulcator.)		
11 12 12	atrix	Redox Feature			
(inches) Color (moi		Color (moist) %	Type <sup>1</sup> Lo	oc <sup>2</sup>	Texture Remarks
	100%	No		_	Sandy silt; fine
		5YR 4/6 & 2.5 YR 4/8			Silty sand
6-16"10YR 3/2		2.5 YR 4/8		M	large cobbles with oxidiation
				_	
<sup>1</sup> Type: C=Concentration, D	=Depletion, RM	=Reduced Matrix. 21 ocatio	n. Pl =Pore Lin	ing R	C=Root Channel, M=Matrix.
Hydric Soil Indicators:	D opiodori, i iii	Indicators for Problema			G-1000 Grianner, W-Matrix.
Histosol or Histel (A1)		Alaska Color Change			Alaska Gleyed Without Hue 5Y or Redder
Histic Epipedon (A2)		Alaska Alpine Swale	8		Underlying Layer
Hydrogen Sulfide (A4)		Alaska Redox With 2			Other (Explain in Remarks)
Thick Dark Surface (A1	2)				- A state apply - No condition on the control of the condition of the cond
X Alaska Gleyed (A13)		<sup>3</sup> One indicator of hydroph	nytic vegetation,	one p	orimary indicator of wetland hydrology,
Alaska Redox (A14)		and an appropriate lan			
Alaska Gleyed Pores (A	A15)	<sup>4</sup> Give details of color cha			
Restrictive Layer (if prese	nt):				
Туре:	***	_			
Depth (inches):					Hydric Soil Present? Yes X No
Remarks:					
HYDROLOGY					
Wetland Hydrology Indica	tore:				Casandan Indicators (O su sussessitut)
Primary Indicators (any one		niont)			Secondary Indicators (2 or more required)
A STATE OF THE STA					
Surface Water (A1)				_	Water-stained Leaves (B9)
	-	_ Surface Soil Cracks (B6)	(0.7)	-	Drainage Patterns (B10)
High Water Table (A2)	-	_ Inundation Visible on Aeri			<ul><li>Drainage Patterns (B10)</li><li>Oxidized Rhizospheres on Living Roots (C3)</li></ul>
Saturation (A3)	-	<ul><li>Inundation Visible on Aeria</li><li>Sparsely Vegetated Concerns</li></ul>	ave Surface (B8		<ul> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> </ul>
Saturation (A3) Water Marks (B1)		<ul><li>Inundation Visible on Aeri</li><li>Sparsely Vegetated Conc</li><li>Hydrogen Sulfide Odor (C</li></ul>	ave Surface (B8		<ul> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> </ul>
Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	-	Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C Dry-Season Water Table (	ave Surface (B8 1) (C2)		<ul> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> </ul>
<ul><li>Saturation (A3)</li><li>Water Marks (B1)</li><li>Sediment Deposits (B2)</li><li>Drift Deposits (B3)</li></ul>	-	<ul><li>Inundation Visible on Aeri</li><li>Sparsely Vegetated Conc</li><li>Hydrogen Sulfide Odor (C</li></ul>	ave Surface (B8 1) (C2)		<ul> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>X Geomorphic Position (D2)</li> </ul>
Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	-	Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C Dry-Season Water Table (	ave Surface (B8 1) (C2)		<ul> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>X Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> </ul>
<ul> <li>Saturation (A3)</li> <li>Water Marks (B1)</li> <li>Sediment Deposits (B2)</li> <li>Drift Deposits (B3)</li> <li>Mat or Crust of Algae or</li> </ul>	-	Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C Dry-Season Water Table (	ave Surface (B8 1) (C2)		<ul> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>X Geomorphic Position (D2)</li> </ul>
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae orX Iron Deposits (B5)	-	Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C Dry-Season Water Table (	ave Surface (B8 1) (C2)		<ul> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>X Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>X Microtopographic Relief (D4)</li> </ul>
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae orX Iron Deposits (B5)  Field Observations:	- - - - Marl (B4)	Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C Dry-Season Water Table (	ave Surface (B8 (1) (C2) s)		<ul> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>X Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>X Microtopographic Relief (D4)</li> </ul>
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae orX Iron Deposits (B5)  Field Observations: Surface Water Present?	Marl (B4)	Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C Dry-Season Water Table (  Other (Explain in Remarks	ave Surface (B8 (1) (C2) (s)		<ul> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>X Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>X Microtopographic Relief (D4)</li> </ul>
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae orX Iron Deposits (B5)  Field Observations: Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe)	Marl (B4)  Yes N  Yes N	Inundation Visible on Aeri Sparsely Vegetated Conc Hydrogen Sulfide Odor (C Dry-Season Water Table (C) Other (Explain in Remarks) So Depth (inches): So So So	ave Surface (B8 (1) (C2) s)	Wetlar	Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) X Microtopographic Relief (D4) FAC-Neutral Test (D5)
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae orX Iron Deposits (B5)  Field Observations: Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe)	Marl (B4)  Yes N  Yes N	Inundation Visible on Aeri Sparsely Vegetated Conc Hydrogen Sulfide Odor (C Dry-Season Water Table (C) Other (Explain in Remarks) So Depth (inches): So So So	ave Surface (B8 (1) (C2) s)	Wetlar	Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) X Microtopographic Relief (D4) FAC-Neutral Test (D5)
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or X_ Iron Deposits (B5)  Field Observations: Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe) Describe Recorded Data (str	Marl (B4)  Yes N  Yes N	Inundation Visible on Aeri Sparsely Vegetated Conc Hydrogen Sulfide Odor (C Dry-Season Water Table (C) Other (Explain in Remarks) So Depth (inches): So So So	ave Surface (B8 (1) (C2) s)	Wetlar	Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) X Microtopographic Relief (D4) FAC-Neutral Test (D5)
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or Iron Deposits (B5)  Field Observations: Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe) Describe Recorded Data (str	Marl (B4)  Yes N Yes _X_ N ream gauge, mo	Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C Dry-Season Water Table (C Other (Explain in Remarks))  No Depth (inches): No Depth (inches): nitoring well, aerial photos, principle of the property	ave Surface (B8 (C2) s)	Wetlar	Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) X Microtopographic Relief (D4) FAC-Neutral Test (D5)  and Hydrology Present? YesX No
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or Iron Deposits (B5)  Field Observations: Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe) Describe Recorded Data (str	Marl (B4)  Yes N Yes _X_ N ream gauge, mo	Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C Dry-Season Water Table (C Other (Explain in Remarks))  No Depth (inches): No Depth (inches): nitoring well, aerial photos, principle of the property	ave Surface (B8 (C2) s)	Wetlar	Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) X Microtopographic Relief (D4) FAC-Neutral Test (D5)  and Hydrology Present? YesX No
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae orX_ Iron Deposits (B5)  Field Observations: Surface Water Present? Water Table Present?	Marl (B4)  Yes N Yes _X_ N ream gauge, mo	Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C Dry-Season Water Table (C Other (Explain in Remarks))  No Depth (inches): No Depth (inches): nitoring well, aerial photos, principle of the property of the propert	ave Surface (B8 (C2) s)	Wetlar	Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) X Microtopographic Relief (D4) FAC-Neutral Test (D5)  and Hydrology Present? YesX No

	State Recreat	ion Area	Borough/City: Kodiak Island	Sampling Date: 9 12 07
Applicant/Owner: Alaska Department of Transportation / Federal Av				
Investigator(s): M. Raad, T Johnson, R. Ruggiero				
Local relief (concave, convex, none): none				
Subregion: Southcentral Alaska Lat:				Detum
Are climatic / hydrologic conditions on the site typical for this time of				
				(7)
Are Vegetation, Soil, or Hydrology significar				
Are Vegetation, Soil, or Hydrology naturally			needed, explain any answers in R	
SUMMARY OF FINDINGS – Attach site map showi	ng sampliı	ng point	locations, transects, imp	ortant features, etc
Hydrophytic Vegetation Present? Yes NoX				
Hydric Soil Present? Yes No X	IS t	he Sample		
Wetland Hydrology Present? Yes No _X	Wit	hin a Wetla	and? Yes	No X
Remarks:				
/EGETATION				
	Absolute	Indicator		
Species (Use scientific names. List all species in plot.)	% Cover	14.15.45	Prevalence Index:	
1. Alnus sinuata	50%	FAC	Total % Cover of:	
2. Athyrium filix-femina		FAC	OBL species	A
3. Picea sitchensis		FACU	FACW species	
4. Rubus spectabilis	10%	FACU	FAC species65	
5. <u>Sambucus racemosa</u> 6. <u>moss</u>	50% 60%	FACU	FACU species 60	
7			UPL species Column Totals: 125	x 5 =(B)
8			Prevalence Index = B/A	
9				
10				
11			Other Indicators of Hedronk	41-11-1-0
12			Other Indicators of Hydrophy (Record supporting data in Rer	[ ] - [ [ - [ - [ - [ - [ - [ - [ - [ -
13			sheet.)	r managasi keralah salah s
14			Wetland Cryptogams (reco	ord species and cover
15			at left)	
16			Morphological Adaptations	
17			Problematic Hydrophytic V	egetation (Explain)
18				
19	-jy			
20				
Total Cove	er: <u>100%</u>	-	Hydrophytic	
Plot size9-meter radius % Bare Groun	d <u>0%</u>		Vegetation	
	ophytes		Present? Yes	NoX
% Cover of Wetland Bryophytes Total Cover of Bry				
% Cover of Wetland Bryophytes Total Cover of Bry Remarks:				

Depth Matrix (inches) Color (moist)	%	Color (moist) % Type <sup>1</sup>	_Loc <sup>2</sup>	Texture	Remarks
0-16" 10YR 3/2	100%	None		Silty sandy loa	ım w/cobbles 3" max. some iron fro
					old oil cans in the area
Type: C=Concentration, D=Dep	oletion BM=F	Reduced Matrix. <sup>2</sup> Location: PL=Pore	Lining R	C=Root Channe	al M=Matrix
lydric Soil Indicators:		Indicators for Problematic Hydric		o-noor onamic	a, w-manx
_ Histosol or Histel (A1)		Alaska Color Change (TA4) <sup>4</sup>		Alaska (	Gleyed Without Hue 5Y or Redder
Histic Epipedon (A2)		Alaska Alpine Swales (TA5)			lying Layer
Hydrogen Sulfide (A4)		_ Alaska Redox With 2.5Y Hue			Explain in Remarks)
_ Thick Dark Surface (A12)					,
_ Alaska Gleyed (A13)		<sup>3</sup> One indicator of hydrophytic vegetat	tion, one p	orimary indicator	of wetland hydrology,
_ Alaska Redox (A14)		and an appropriate landscape pos	ition must	be present.	
_ Alaska Gleyed Pores (A15)		<sup>4</sup> Give details of color change in Rema	arks.		
estrictive Layer (if present):					
T					
Type:					
Depth (inches):				Hydric Soil P	resent? Yes No _X
				Hydric Soil P	resent? Yes No _X
Depth (inches):				Hydric Soil P	resent? Yes No _X
Depth (inches):					
Depth (inches):  demarks:  CDROLOGY  Vetland Hydrology Indicators:	1			Secondary Ir	ndicators (2 or more required)
Depth (inches):emarks:  /DROLOGY /etland Hydrology Indicators: rimary Indicators (any one indicators)	ator is sufficie	ent)		Secondary Ir	ndicators (2 or more required) ained Leaves (B9)
Depth (inches):emarks:  **TOROLOGY**  **Jetland Hydrology Indicators: rimary Indicators (any one indicators (any one indicators) and the surface Water (A1)	ator is sufficie	ent) Surface Soil Cracks (B6)	B7)	Secondary Ir Water-st Drainage	adicators (2 or more required) ained Leaves (B9) Patterns (B10)
Depth (inches):emarks:  /DROLOGY /etland Hydrology Indicators: rimary Indicators (any one indic Surface Water (A1) High Water Table (A2)	ator is sufficie	ent) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery (		Secondary Ir Water-st Drainage Oxidized	ndicators (2 or more required) ained Leaves (B9) e Patterns (B10) I Rhizospheres on Living Roots (C3
Depth (inches):emarks:  **TOROLOGY**  **Jetland Hydrology Indicators: rimary Indicators (any one indicators (any one indicators) and the surface Water (A1)	ator is sufficie	ent) Surface Soil Cracks (B6)		Secondary Ir Water-st Drainage Oxidized	ndicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3
Depth (inches):emarks:  /DROLOGY /etland Hydrology Indicators: rimary Indicators (any one indic _ Surface Water (A1) _ High Water Table (A2) _ Saturation (A3)	ator is sufficie	ent) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery ( Sparsely Vegetated Concave Surface		Secondary Ir  Water-st  Drainage Oxidized Presence Salt Dep	ndicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3
Depth (inches):	ator is sufficie	ent) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery ( Sparsely Vegetated Concave Surface Hydrogen Sulfide Odor (C1)		Secondary Ir  Water-st  Drainage Oxidized Presence Salt Dep Stunted	ndicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) osits (C5)
Depth (inches):	ator is sufficie	ent) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery ( Sparsely Vegetated Concave Surface Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)		Secondary Ir  Water-st  Drainage Oxidized Presence Salt Dep Stunted Geomory	ndicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) osits (C5) or Stressed Plants (D1)
Depth (inches):	ator is sufficie	ent) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery ( Sparsely Vegetated Concave Surface Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)		Secondary Ir  Water-st  Drainage Oxidized Presence Salt Dep Stunted Geomory Shallow	adicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) osits (C5) or Stressed Plants (D1)
Depth (inches):	ator is sufficie	ent) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery ( Sparsely Vegetated Concave Surface Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)		Secondary Ir  Water-st  Drainage  Oxidized  Presence  Salt Dep  Stunted  Geomory  Shallow  Microtop	adicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) osits (C5) or Stressed Plants (D1) ohic Position (D2) Aquitard (D3)
Depth (inches):	ator is sufficie	ent) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery ( Sparsely Vegetated Concave Surface Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)		Secondary Ir  Water-st  Drainage  Oxidized  Presence  Salt Dep  Stunted  Geomory  Shallow  Microtop	adicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) osits (C5) or Stressed Plants (D1) ohic Position (D2) Aquitard (D3) ographic Relief (D4)
Depth (inches):	ator is sufficie	ent) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery ( Sparsely Vegetated Concave Surface Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Other (Explain in Remarks)	(B8)	Secondary Ir  Water-st  Drainage  Oxidized  Presence  Salt Dep  Stunted  Geomory  Shallow  Microtop	adicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) osits (C5) or Stressed Plants (D1) ohic Position (D2) Aquitard (D3) ographic Relief (D4)
Depth (inches):	ator is sufficie	ent)  Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery ( Sparsely Vegetated Concave Surface Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Other (Explain in Remarks) X Depth (inches):X Depth (inches):	(B8)	Secondary Ir  Water-st  Drainage Oxidized Presence Salt Dep Stunted Geomory Shallow Microtop FAC-Neu	adicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) osits (C5) or Stressed Plants (D1) ohic Position (D2) Aquitard (D3) ographic Relief (D4) utral Test (D5)
Depth (inches):  Depth (inches):  Demarks:  POROLOGY  Vetland Hydrology Indicators:  rimary Indicators (any one indicators)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Mat or Crust of Algae or Marlation Deposits (B5)  Teld Observations:  Urface Water Present?  Vater Table Present?  Auturation Present?  Procludes capillary fringe)	ator is sufficie	ent) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery ( Sparsely Vegetated Concave Surface Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Other (Explain in Remarks)	(B8)	Secondary Ir  Water-st  Drainage Oxidized Presence Salt Dep Stunted Geomory Shallow Microtop FAC-Net	adicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) osits (C5) or Stressed Plants (D1) ohic Position (D2) Aquitard (D3) ographic Relief (D4)
Depth (inches):  Depth (inches):  Demarks:  POROLOGY  Vetland Hydrology Indicators:  rimary Indicators (any one indicators)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Mat or Crust of Algae or Marlation Deposits (B5)  Teld Observations:  Urface Water Present?  Vater Table Present?  Auturation Present?  Procludes capillary fringe)	ator is sufficie	ent) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery ( Sparsely Vegetated Concave Surface Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Other (Explain in Remarks) X Depth (inches):X Depth (inches):X Depth (inches):X Depth (inches):	(B8)	Secondary Ir  Water-st  Drainage Oxidized Presence Salt Dep Stunted Geomory Shallow Microtop FAC-Net	adicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) osits (C5) or Stressed Plants (D1) ohic Position (D2) Aquitard (D3) ographic Relief (D4) utral Test (D5)
Depth (inches):  Depth (inches):  Demarks:  POROLOGY  Vetland Hydrology Indicators:  rimary Indicators (any one indicators)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Mat or Crust of Algae or Marlation Deposits (B5)  Teld Observations:  Urface Water Present?  Vater Table Present?  Auturation Present?  Procludes capillary fringe)	ator is sufficie	ent) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery ( Sparsely Vegetated Concave Surface Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Other (Explain in Remarks) X Depth (inches):X Depth (inches):X Depth (inches):X Depth (inches):	(B8)	Secondary Ir  Water-st  Drainage Oxidized Presence Salt Dep Stunted Geomory Shallow Microtop FAC-Net	adicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) osits (C5) or Stressed Plants (D1) ohic Position (D2) Aquitard (D3) ographic Relief (D4) utral Test (D5)
Depth (inches):	ator is sufficie	ent) Surface Soil Cracks (B6) Inundation Visible on Aerial Imagery ( Sparsely Vegetated Concave Surface Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Other (Explain in Remarks) X Depth (inches):X Depth (inches):X Depth (inches):X Depth (inches):	(B8)	Secondary Ir  Water-st  Drainage Oxidized Presence Salt Dep Stunted Geomory Shallow Microtop FAC-Net	adicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) osits (C5) or Stressed Plants (D1) ohic Position (D2) Aquitard (D3) ographic Relief (D4) utral Test (D5)

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. S	tate Recreat	ion Area	Borough/City: Kodiak Island Sampling Date: 9.12.07
Applicant/Owner: Alaska Department of Transportation / Federal Avid			Sampling Point: A-5
Investigator(s): M. Raad, T Johnson, R. Ruggiero			
Local relief (concave, convex, none): none			
Subregion: Southcentral Alaska Lat:			
Are climatic / hydrologic conditions on the site typical for this time of	vear? Yes	X No.	(If no explain in Remarks )
Are Vegetation, Soil, or Hydrology significant			
Are Vegetation, Soil, or Hydrology naturally p			needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showin			
Hydrophytic Vegetation Present? Yes X No	le ti	ne Sample	
Hydric Soil Present?         Yes _ X		nin a Wetla	nnd? Yes X No
Remarks:	-		
/EGETATION			
0	Absolute	Indicator	
Species (Use scientific names. List all species in plot.)  1. Calamagrostis canadensis	% Cover	SKITAVAROV	Prevalence Index:
0.00 !!	10%	FAC	Total % Cover of:Multiply by:
2. <u>Carex limosa</u> 3. <u>Carex lyngbyei</u>	-472/92/31	OBL OBL	OBL species
4. <u>Hordeum brachyantherum</u>		FAC	FACW species x 2 = FAC species 50
5. <u>Poa eminens</u>	35%	FAC	FACU species x 4 =
6			UPL species x 5 =
7			Column Totals:(A)(B)
8			Prevalence Index = B/A =
9			
11			
12			Other Indicators of Hydrophytic Vegetation:
13			(Record supporting data in Remarks or on a separate sheet.)
14			Wetland Cryptogams (record species and cover
15			at left)
16			Morphological Adaptations
17			Problematic Hydrophytic Vegetation (Explain)
18			
19			
20			
Plot size	: <u>100%</u>		Hydrophytic Vegetation
% Cover of Wetland Bryophytes Total Cover of Bryon			Present? Yes X No
Remarks:			
nomano.			

(inches) Color (moist	) %	Redox Features Color (moist) %	Type <sup>1</sup> Loc <sup>2</sup>	Texture Remarks
			_typeLoc	Texture
0-6" 2.5Y 3/1	100%	None		Silty sandy clay; fine; mucky
6-16" 10YR 6/4	100%_	5YR 3/4	CM	sand, ash
ype: C=Concentration, D=	Depletion, RM	=Reduced Matrix. <sup>2</sup> Location	: PL=Pore Lining, F	RC=Root Channel, M=Matrix.
lydric Soil Indicators:		Indicators for Problemat		
Histosol or Histel (A1)  Histic Epipedon (A2)  Hydrogen Sulfide (A4)  Thick Dark Surface (A12)	).	<ul><li> Alaska Color Change</li><li> Alaska Alpine Swales</li><li>_ Alaska Redox With 2.5</li></ul>	(TA5) 5Y Hue	Alaska Gleyed Without Hue 5Y or Redder     Underlying Layer     Other (Explain in Remarks)
_ Alaska Gleyed (A13)				primary indicator of wetland hydrology,
_ Alaska Redox (A14)		and an appropriate land		t be present.
_ Alaska Gleyed Pores (A1		<sup>4</sup> Give details of color chan	ge in Remarks.	
estrictive Layer (if presen	t):			
Type:				
Depth (inches):				Hydric Soil Present? Yes X No
Remarks:				
/DROLOGY	urs.			Secondary Indicators (2 or more required)
/DROLOGY /etland Hydrology Indicato		icient\		Secondary Indicators (2 or more required)  Water-stained Leaves (B9)
'DROLOGY /etland Hydrology Indicato rimary Indicators (any one in		DOM D. SALEMBER M. MICHAEL		Water-stained Leaves (B9)
'DROLOGY  Vetland Hydrology Indicator rimary Indicators (any one in		Surface Soil Cracks (B6)	I Imagery (R7)	<ul><li>Water-stained Leaves (B9)</li><li>Drainage Patterns (B10)</li></ul>
*DROLOGY  Vetland Hydrology Indicator rimary Indicators (any one in Surface Water (A1) High Water Table (A2)		Surface Soil Cracks (B6) Inundation Visible on Aeria		<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> </ul>
/DROLOGY /etland Hydrology Indicatorimary Indicators (any one in Surface Water (A1) // High Water Table (A2) // Saturation (A3)		Surface Soil Cracks (B6) Inundation Visible on Aeria Sparsely Vegetated Concar	ve Surface (B8)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> </ul>
TOROLOGY  Tetland Hydrology Indicator  Timary Indicators (any one in  Surface Water (A1)  High Water Table (A2)  Saturation (A3)		Surface Soil Cracks (B6) Inundation Visible on Aeria	ve Surface (B8)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> </ul>
/DROLOGY /etland Hydrology Indicator rimary Indicators (any one in Surface Water (A1) /	ndicator is suff	Surface Soil Cracks (B6) Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C1	ve Surface (B8)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> </ul>
/DROLOGY /etland Hydrology Indicatorimary Indicators (any one in Surface Water (A1) /	ndicator is suff	Surface Soil Cracks (B6) Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C	ve Surface (B8)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> </ul>
/DROLOGY /etland Hydrology Indicatorimary Indicators (any one in Surface Water (A1) /	ndicator is suff	Surface Soil Cracks (B6) Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C	ve Surface (B8)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>X Geomorphic Position (D2)</li> </ul>
Petland Hydrology Indicatorimary Indicators (any one in Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or It	ndicator is suff	Surface Soil Cracks (B6) Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C	ve Surface (B8)	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4)
rDROLOGY  retland Hydrology Indicator rimary Indicators (any one in Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or It Iron Deposits (B5)  eld Observations:	ndicator is suff	Surface Soil Cracks (B6) Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C	ve Surface (B8) ) C2)	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4)
/DROLOGY /etland Hydrology Indicatorimary Indicators (any one in Surface Water (A1) ( High Water Table (A2) ( Saturation (A3) ( Water Marks (B1)   Sediment Deposits (B2)   Drift Deposits (B3)   Mat or Crust of Algae or Interpretation (B5)  eld Observations:  urface Water Present?	Marl (B4)	Surface Soil Cracks (B6) Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)	ve Surface (B8) ) C2)	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4)
/DROLOGY /etland Hydrology Indicator rimary Indicators (any one in Surface Water (A1) ( High Water Table (A2) ( Saturation (A3) ( Water Marks (B1)   Sediment Deposits (B2)   Drift Deposits (B3)   Mat or Crust of Algae or North Incomplete (B5)  eld Observations: curface Water Present? caturation Present? caturation Present? caturation Present? caturation Present?	Marl (B4)  Yes _X Yes _X Yes _X	Surface Soil Cracks (B6) Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)  No Depth (inches): No Depth (inches): No Depth (inches):	ve Surface (B8) ) C2)  1/20" 1" 0" Wetla	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  and Hydrology Present? YesX No
Vetland Hydrology Indicator rimary Indicators (any one in Surface Water (A1)  High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or North Indicators: urface Water Present? Vater Table Present? aturation Present?	Marl (B4)  Yes _X Yes _X Yes _X	Surface Soil Cracks (B6) Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)  No Depth (inches): No Depth (inches):	ve Surface (B8) ) C2)  1/20" 1" 0" Wetla	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  and Hydrology Present? YesX No
Drift Deposits (B3) Mat or Crust of Algae or I _ Iron Deposits (B5)  rield Observations: surface Water Present? Vater Table Present? saturation Present? ncludes capillary fringe)	Marl (B4)  Yes _X Yes _X Yes _X	Surface Soil Cracks (B6) Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)  No Depth (inches): No Depth (inches): No Depth (inches):	ve Surface (B8) ) C2)  1/20" 1" 0" Wetla	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  and Hydrology Present? YesX No
YDROLOGY  Vetland Hydrology Indicator Primary Indicators (any one in X Surface Water (A1) X High Water Table (A2) X Saturation (A3) X Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or In Iron Deposits (B5)  ield Observations: urface Water Present? Vater Table Present? aturation Present? aturation Present? includes capillary fringe) escribe Recorded Data (streen)	Marl (B4)  Yes _X Yes _X Yes _X am gauge, mo	Surface Soil Cracks (B6) Inundation Visible on Aeria Sparsely Vegetated Conca Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)  No Depth (inches): No Depth (inches): No Depth (inches): onitoring well, aerial photos, pre	ve Surface (B8) ) C2)  1/20" 1" 0" Wetla	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) X Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  and Hydrology Present? YesX No

Project/Site: Kodiak Airport / Coast Guar	rd Reservation / Buskin R. S	State Recrea	tion Area	Borough/City: Kodiak	Island	Sampling Date: 9.12.07
Applicant/Owner: Alaska Department of						
Investigator(s): M. Raad, T Johnson, R.						
Local relief (concave, convex, none): none					,	
Subregion: Southcentral Alaska						Datum:
Are climatic / hydrologic conditions on the						
Are Vegetation, Soil, or H						
Are Vegetation, Soil, or H						
SUMMARY OF FINDINGS – Att	ach site map showir	ng sampli	ng point	locations, transe	cts, imp	ortant features, etc
Hydrophytic Vegetation Present?	Yes NoX	le (	ha Camula	d 8		
Hydric Soil Present?	Yes No _X		the Sample thin a Wetla		Vaa	No. V
Wetland Hydrology Present?	Yes No _X	WII	iiii a vveua	illu r	165	NoX
Remarks:						
VEGETATION						
VEGETATION		Absolute	Indicator			
Species (Use scientific names. List all s	species in plot.)	% Cover	Indicator _Status	Prevalence Index:		
Agrostis stolonifera		TR	FAC	Total % Cover	of:	Multiply by:
2. Calamagrostis canadensis		10%	FAC			x 1 =
3. Picea sitchensis		100%	FACU	FACW species		
4. Rumex acetosella				FAC species	15	x 3 = 45
5				FACU species	105	_x 4 = <u>420</u>
6.				UPL species		x 5 =
7						(A) 465 (B)
8				Prevalence Inc	1ex = B/A	= _3.88
9						
10						
11				Other Indicators of		ytic Vegetation: marks or on a separate
Mark'				sheet.)	Jala III Nei	marks of off a separate
13				Wetland Crypto	gams (reco	ord species and cover
15				at left)		
16				Morphological A	daptations	3
17				Problematic Hyd	Irophytic V	egetation (Explain)
18						
19		-				
20						
		r: <u>100%</u>		Undra - b. M-		
Plot size _1-meter radius	% Bare Ground			Hydrophytic Vegetation		
					Yes	NoX
% Cover of Wetland Bryophytes Remarks:	Total Cover of Bryo	phytes				
nemarks:						

	Point:	A-6	

Profile Description: (Description: Matri		on necded to	Redox Feature	es		
(inches) Color (moist)		Color (moi		_Type <sup>1</sup>	Loc <sup>2</sup>	Texture Remarks
0-4" 2.5Y 2.5/1	100%	None				loam with heavy organic content
4-6" 10YR 7/3	100%	None				ash
6-12" 10YR 2/1	100%					blocky, silty loam
	10070		-			blocky, sitty loam
ROCK						
Type: C=Concentration, D=[	Depletion, RM					C=Root Channel, M=Matrix.
Hydric Soil Indicators:			s for Problema		Soils":	All-state Olas Change
Histosol or Histel (A1)			a Color Change	14-1-1-1-1-1		Alaska Gleyed Without Hue 5Y or Redde
Histic Epipedon (A2)			a Alpine Swales			Underlying Layer
<ul><li>Hydrogen Sulfide (A4)</li><li>Thick Dark Surface (A12)</li></ul>		_ Alaska	a Redox With 2.	5Y Hue		Other (Explain in Remarks)
Alaska Gleyed (A13)		<sup>3</sup> One indic	eator of hydroph	vtio vogoto	tion one r	orimary indicator of wetland hydrology,
Alaska Gleyed (A13) Alaska Redox (A14)			appropriate land	Electrical and the control of the		THE PROPERTY OF THE PROPERTY O
Alaska Gleyed Pores (A1:	5)	7	alls of color char			DO PIODOTIL
Restrictive Layer (if present		ಾಬಲನ್ ಮಾರ್ಡ್		3-111		1
7 7 1	)-					
Type:						
Type: Depth (inches):						Hydric Soil Present? Yes No _X
						Hydric Soil Present? Yes No _X
Depth (inches):Remarks:  YDROLOGY Vetland Hydrology Indicato	rs:					Secondary Indicators (2 or more required)
Depth (inches):Remarks:  YDROLOGY  Vetland Hydrology Indicato Primary Indicators (any one in	rs:	cient)	oil Cracks (B6)			Secondary Indicators (2 or more required)  Water-stained Leaves (B9)
Depth (inches): Remarks:  YDROLOGY  Vetland Hydrology Indicato Vrimary Indicators (any one in	rs:	cient)	oil Cracks (B6) Visible on Aeria	al Imagery	(B7)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)
Depth (inches): Remarks:  YDROLOGY  Vetland Hydrology Indicato Primary Indicators (any one in	rs: dicator is suff	cient) Surface Sc Inundation	Visible on Aeria			Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C
Depth (inches): Remarks:  YDROLOGY  Vetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) High Water Table (A2)	rs: dicator is suff	cient) Surface So Inundation Sparsely V	and the second second second	ave Surface		Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (Control of the presence of Reduced Iron (C4)
Depth (inches): Remarks:  YDROLOGY  Vetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) High Water Table (A2) Saturation (A3)	rs: dicator is suff	cient) Surface So Inundation Sparsely V Hydrogen S	Visible on Aeria egetated Conca	ave Surface		Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C
Depth (inches): Remarks:  YDROLOGY  Vetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	rs: dicator is suffi	cient)  Surface So  Inundation  Sparsely V  Hydrogen S	Visible on Aeria egetated Conca Sulfide Odor (C	ave Surface 1) C2)		Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (Compare)  Presence of Reduced Iron (C4)  Salt Deposits (C5)
Depth (inches):  Parantks:  YDROLOGY  Vetland Hydrology Indicato  Primary Indicators (any one in  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)	rs: dicator is suff	cient)  Surface So  Inundation  Sparsely V  Hydrogen S	Visible on Aeria egetated Conca Sulfide Odor (C n Water Table (	ave Surface 1) C2)		Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (Compared of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)
Depth (inches):	rs: dicator is suff	cient)  Surface So  Inundation  Sparsely V  Hydrogen S	Visible on Aeria egetated Conca Sulfide Odor (C n Water Table (	ave Surface 1) C2)		Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (Compresence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Depth (inches):	rs: dicator is suff	cient)  Surface So  Inundation  Sparsely V  Hydrogen S	Visible on Aeria egetated Conca Sulfide Odor (C n Water Table (	ave Surface 1) C2)		Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (Compresence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Depth (inches):	rs: dicator is suffi	cient)  Surface So  Inundation  Sparsely V  Hydrogen  Dry-Seaso  Other (Expl	Visible on Aeria degetated Conca Sulfide Odor (Con Water Table (Con Water	ave Surface 1) C2)	e (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (Compresence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Depth (inches):	rs: dicator is suff	cient)  Surface So Inundation Sparsely V Hydrogen So Dry-Seaso Other (Expl	Visible on Aeria (egetated Conca Sulfide Odor (Con Water Table (contain in Remarks))  epth (inches):	ave Surface 1) C2)	e (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (Compresence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Depth (inches):	rs: dicator is suff	cient)  Surface So Inundation Sparsely V Hydrogen So Other (Expl	Visible on Aeria degetated Conca Sulfide Odor (Con Water Table (Con Water	ave Surface 1) C2)	e (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (Compresence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Property (inches):	rs: dicator is suff	cient)  Surface So Inundation Sparsely V Hydrogen S Other (Expl	Visible on Aeria (egetated Conca Sulfide Odor (Con Water Table (contain in Remarks)  eepth (inches): eepth (inches): eepth (inches):	ave Surface 1) C2)	e (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (CPresence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Depth (inches):	rs: dicator is suff	cient)  Surface So Inundation Sparsely V Hydrogen S Other (Expl	Visible on Aeria (egetated Conca Sulfide Odor (Con Water Table (contain in Remarks)  eepth (inches): eepth (inches): eepth (inches):	ave Surface 1) C2)	e (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (CPresence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Property (inches):	rs: dicator is suff	cient)  Surface So Inundation Sparsely V Hydrogen S Other (Expl	Visible on Aeria (egetated Conca Sulfide Odor (Con Water Table (contain in Remarks)  eepth (inches): eepth (inches): eepth (inches):	ave Surface 1) C2)	e (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (CPresence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Depth (inches):	rs: dicator is suff  farl (B4)  Yes Yes Yes am gauge, mo	cient)  Surface So Inundation Sparsely V Hydrogen S Other (Expl	Visible on Aeria (egetated Conca Sulfide Odor (Con Water Table (contain in Remarks)  eepth (inches): eepth (inches): eepth (inches):	ave Surface 1) C2)	e (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (CPresence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Depth (inches):	rs: dicator is suff  farl (B4)  Yes Yes Yes am gauge, mo	cient)  Surface So Inundation Sparsely V Hydrogen S Other (Expl	Visible on Aeria (egetated Conca Sulfide Odor (Con Water Table (contain in Remarks)  eepth (inches): eepth (inches): eepth (inches):	ave Surface 1) C2)	e (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (CPresence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. St	ate Recreation	on Area	Borough/City: Kodiak Island Sampling Date: 9.12.0
Applicant/Owner: Alaska Department of Transportation / Federal Avia	tion Administ		Sampling Point: B-1
Investigator(s): M. Raad, T Johnson, R. Ruggiero			_Landform (hillside, terrace, hummocks, etc.): terrace
Local relief (concave, convex, none): none			
Subregion: Southcentral Alaska Lat:			
Are climatic / hydrologic conditions on the site typical for this time of y			
Are Vegetation, Soil, or Hydrology significantly			
Are Vegetation, Soil, or Hydrology naturally pr	oblematic?	(If n	needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map showing	g samplin	g point	locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes X No  Hydric Soil Present? Yes X No	Is th	e Sample	d Area
Hydric Soil Present?         YesX No           Wetland Hydrology Present?         YesX No	with	in a Wetla	nd? Yes X No
Remarks:			
VVJ.8/102999998-1			
VEGETATION			
	Absolute	Indicator	
Species (Use scientific names. List all species in plot.)		Status	Prevalence Index:
1. Alnus sinuata	10%	FAC	Total % Cover of: Multiply by:
2. Angelica lucida	25%	FACU	OBL species10 x 1 =10
3. Argentina anserina		FACW	FACW species7 x 2 =14
4. <u>Calamagrostis canadensis</u>	40%	FAC	FAC species140 x 3 =420
5. <u>Carex limosa</u>	10%	OBL	FACU species25 x 4 =100
6. <u>Equisetum hyemale</u>	TR	FACW	UPL species x 5 =
7. Geum macrophyllum	15%	FAC	Column Totals: <u>182</u> (A) <u>544</u> (B)
8. Ranunculus repens	5%	FAC	Prevalence Index = B/A = 2.99
9. Rumex acetosella		FACU	
10. <u>Salix scouleriana</u>	35%	FAC	
11. Salix sitchensis	35%	FAC	Other Indicators of Hydrophytic Vegetation:
12			(Record supporting data in Remarks or on a separate sheet.)
13			Wetland Cryptogams (record species and cover
14			at left)
15			Morphological Adaptations
16			Problematic Hydrophytic Vegetation (Explain)
17			
18			
19			
20			
Total Cover:			Hydrophytic
Plot size 9-meter radius % Bare Ground	0%		Vegetation           Present?         YesX No
% Cover of Wetland Bryophytes Total Cover of Bryop	hytes		
Remarks:			
			l'

Profile Description: (Describe to the depth needed to document the indicator.)

Depth	Matrix	1472		dox Features			VA-2010 145 155 155	200000000000000000000000000000000000000
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	_Loc <sup>2</sup> _	Texture	Remarks
0-8"	10YR 3/2	100%	none			_	silty clay loam	
8-9"	10YR 3/2	100%	5YR 4/6	5%	C	M	silty clay loam	mostly gravel w/redox
9-11"	5Y 2.5/1	100%	none				sand	ash
11-13"	5Y 5/1	100%	5YR 4/6	2%	_C	M	sand	ash
13-16"	5Y 3/1	100%	5YR 4/6	<1%	С	PL	sandy clay	transitions to gravel
	249	-						
	-	0.5	-					
	oncentration, D=Dep	letion, RN					RC=Root Channel	, M=Matrix.
	Indicators:		Indicators for			Soils':	200 0 02	a absorbe como desta de all
	or Histel (A1)			olor Change				leyed Without Hue 5Y or Redder
	pipedon (A2)			pine Swales			120111400000	ring Layer
	en Sulfide (A4)		_ Alaska Red	dox With 2.5	Y Hue		Other (Ex	xplain in Remarks)
	ark Surface (A12)		200	200				45 12 (21a - 2) - 2
	Gleyed (A13)			A 15 (5)	177.4			of wetland hydrology,
	Redox (A14)			The record of the same			t be present.	
	Gleyed Pores (A15)		⁴Give details o	f color chang	ge in Rem	narks.		
estrictive	Layer (if present):							
Туре:	ches):						Hydric Soil Pr	esent? Yes X No
Type:	ches):							
Type: Depth (incemarks:  'DROLO  'etland Hye	GY drology Indicators:						Secondary Inc	dicators (2 or more required)
Type: Depth (incemarks:  'DROLO  'etland Hydrimary Indice	GY drology Indicators: cators (any one indic		ificient)				Secondary Inc.  Water-sta	dicators (2 or more required) nined Leaves (B9)
Type: Depth (incemarks:  'DROLO 'etland Hydrimary Indice_ Surface	GY drology Indicators: cators (any one indic		ficient) Surface Soil Cr				Secondary Inc.  Water-sta  X Drainage	dicators (2 or more required) nined Leaves (B9) Patterns (B10)
Type: Depth (incemarks:  DROLO etland Hydimary India _ Surface _ High Wa	GY drology Indicators: cators (any one indic Water (A1) ater Table (A2)		ficient) Surface Soil Cr Inundation Visil	ble on Aerial		700	Secondary Inc.  Water-sta  X Drainage  Oxidized	dicators (2 or more required) nined Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3)
Type: Depth (incemarks:  DROLO  Tetland Hydrimary Indice Surface High Wa Saturation	GY drology Indicators: cators (any one indic Water (A1) ater Table (A2) on (A3)	ator is suf	ficient) Surface Soil Cr Inundation Visil Sparsely Veget	ble on Aerial tated Conca	ve Surface	700	Secondary Inc.  Water-sta X Drainage Oxidized Presence	dicators (2 or more required) sined Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4)
Type: Depth (incemarks:  TDROLO etland Hydinary India Surface High Water Modern Mater	GY drology Indicators: cators (any one indic Water (A1) ater Table (A2) on (A3) larks (B1)	ator is suf	ficient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfic	ble on Aerial tated Conca de Odor (C1	ve Surface )	700	Secondary In:  Water-sta X Drainage Oxidized Presence Salt Depo	dicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) osits (C5)
Type: Depth (incemarks:  DROLO Tetland Hydrimary India Surface High Wa Saturatio Water M Sedimer	GY drology Indicators: cators (any one indic Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2)	ator is suf	ficient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfid	ble on Aerial tated Concar de Odor (C1 ater Table (C	ve Surface )	700	Secondary Inc  Water-sta  X Drainage  Oxidized  Presence  Salt Depo	dicators (2 or more required) nined Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) osits (C5) or Stressed Plants (D1)
Type: Depth (incemarks:  DROLO  Vetland Hydrimary Indice Surface High Water Management of the Sedimer Drift Dep	drology Indicators: cators (any one indicators) Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) posits (B3)	ator is suf	ficient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfic	ble on Aerial tated Concar de Odor (C1 ater Table (C	ve Surface )	700	Secondary Inc.  Water-sta X Drainage Oxidized Presence Salt Depo Stunted of X Geomorp	dicators (2 or more required) sined Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) sits (C5) or Stressed Plants (D1) shic Position (D2)
Type: Depth (incemarks:  TOROLO  Tetland Hydrimary Indice Surface High Water Mater Mater Mater Mater County Material Materials Advantage County Materials Materials Advantage County Mat	drology Indicators: cators (any one indicators (any one indicators (A1) (A2) (A3) (A3) (A3) (A4) (A4) (A4) (A4) (A4) (A4) (A4) (A4	ator is suf	ficient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfid	ble on Aerial tated Concar de Odor (C1 ater Table (C	ve Surface )	700	Secondary Inc.  Water-sta  X Drainage  Oxidized  Presence  Salt Depo  Stunted of  X Geomorp  Shallow A	dicators (2 or more required) nined Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) poits (C5) or Stressed Plants (D1) cquitard (D3)
Type: Depth (incemarks:  TOROLO  Tetland Hydrimary Indice Surface High Water Mater Mater Mater Mater County Material Materials Advantage County Materials Materials Advantage County Mat	drology Indicators: cators (any one indicators (any one indicators (A1) (A2) (A3) (A3) (A3) (A4) (A4) (A4) (A4) (A4) (A4) (A4) (A4	ator is suf	ficient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfid	ble on Aerial tated Concar de Odor (C1 ater Table (C	ve Surface )	700	Secondary Inc.  Water-sta  X Drainage  Oxidized  Presence  Salt Depo  Stunted of  X Geomorp  Shallow A  X Microtopo	dicators (2 or more required) hined Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) histis (C5) or Stressed Plants (D1) hic Position (D2) hquitard (D3) ographic Relief (D4)
Type: Depth (incemarks:  TDROLO  Tetland Hydrimary Indice	drology Indicators: cators (any one indicators): water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) cosits (B3) crust of Algae or Mario	ator is suf	ficient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfid	ble on Aerial tated Concar de Odor (C1 ater Table (C	ve Surface )	700	Secondary Inc.  Water-sta  X Drainage  Oxidized  Presence  Salt Depo  Stunted of  X Geomorp  Shallow A	dicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) sits (C5) or Stressed Plants (D1) chic Position (D2) aquitard (D3) ographic Relief (D4)
Type: Depth (incemarks:  "DROLO Tetland Hydrimary India _ Surface _ High Wa _ Saturatia _ Water M _ Sedimer _ Drift Dep _ Mat or C _ Iron Dep	drology Indicators: cators (any one indicators) water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) cosits (B3) crust of Algae or Mark cosits (B5)	ator is suf	ificient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfid Dry-Season Wa	ble on Aerial tated Concar de Odor (C1 ater Table (C n Remarks)	ve Surface ) C2)	e (B8)	Secondary Inc.  Water-sta  X Drainage  Oxidized  Presence  Salt Depo  Stunted of  X Geomorp  Shallow A  X Microtopo	dicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) sits (C5) or Stressed Plants (D1) chic Position (D2) aquitard (D3) ographic Relief (D4)
Type: Depth (incemarks:  "DROLO Vetland Hydrimary Indice High Water May Sedimer Drift Depth Mat or Color Iron Depth Part Color Water Water Material Material Procession of the pr	drology Indicators: cators (any one indicators) water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2) cosits (B3) crust of Algae or Management (B5) vations: er Present?	ator is suf	ficient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfic Dry-Season Wa Other (Explain in	ble on Aerial tated Concar de Odor (C1 ater Table (C n Remarks)	ve Surface ) C2)	e (B8)	Secondary Inc.  Water-sta  X Drainage  Oxidized  Presence  Salt Depo  Stunted of  X Geomorp  Shallow A  X Microtopo	dicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) sits (C5) or Stressed Plants (D1) chic Position (D2) aquitard (D3) ographic Relief (D4)
Type: Depth (incemarks:  "DROLO  Tetland Hydrimary Indice	drology Indicators: cators (any one indic Water (A1) ater Table (A2) on (A3) darks (B1) nt Deposits (B2) cosits (B3) crust of Algae or Mari cosits (B5) vations: er Present? Y	ator is suf	ficient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfic Dry-Season Wa Other (Explain in	ble on Aerial tated Concar de Odor (C1 ater Table (C n Remarks)  (inches): (inches):	ve Surface ) C2)	e (B8)	Secondary Inc.  Water-sta  X Drainage  Oxidized  Presence  Salt Depo  Stunted of  X Geomorp  Shallow A  X Microtopo  FAC-Neu	dicators (2 or more required) sined Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) sits (C5) or Stressed Plants (D1) chic Position (D2) squitard (D3) ographic Relief (D4) tral Test (D5)
Type:	drology Indicators: cators (any one indicators) cators (an	ator is suf	ficient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfic Dry-Season Wa Other (Explain in	ble on Aerial tated Concar de Odor (C1 ater Table (C n Remarks)  (inches): (inches): (inches):	ve Surface ) C2)	e (B8)	Secondary Inc.  Water-sta  X Drainage  Oxidized  Presence  Salt Depo  Stunted of  X Geomorp  Shallow A  X Microtopo  FAC-Neu	dicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) sits (C5) or Stressed Plants (D1) chic Position (D2) aquitard (D3) ographic Relief (D4)
Type: Depth (includes cape)  Personal Control C	drology Indicators: cators (any one indicators) cators (an	ator is suf	ficient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfic Dry-Season Wa Other (Explain in	ble on Aerial tated Concar de Odor (C1 ater Table (C n Remarks)  (inches): (inches): (inches):	ve Surface ) C2)	e (B8)	Secondary Inc.  Water-sta  X Drainage  Oxidized  Presence  Salt Depo  Stunted of  X Geomorp  Shallow A  X Microtopo  FAC-Neu	dicators (2 or more required) sined Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) sits (C5) or Stressed Plants (D1) chic Position (D2) squitard (D3) ographic Relief (D4) tral Test (D5)
Type:	drology Indicators: cators (any one indicators) cators (an	ator is suf	ficient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfic Dry-Season Wa Other (Explain in	ble on Aerial tated Concar de Odor (C1 ater Table (C n Remarks)  (inches): (inches): (inches):	ve Surface ) C2)	e (B8)	Secondary Inc.  Water-sta  X Drainage  Oxidized  Presence  Salt Depo  Stunted of  X Geomorp  Shallow A  X Microtopo  FAC-Neu	dicators (2 or more required) sined Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) sits (C5) or Stressed Plants (D1) chic Position (D2) squitard (D3) ographic Relief (D4) tral Test (D5)
Type:	drology Indicators: cators (any one indicators: cators (B2) coosits (B3) crust of Algae or Marionsits (B5)	ator is suf	ificient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfid Dry-Season Wa Other (Explain in  No X Depth No X Depth No X Depth No X Depth Onitoring well, aerial	ble on Aerial tated Concar de Odor (C1 ater Table (C n Remarks)  (inches): (inches): (inches): I photos, pre	ve Surface ) C2)	e (B8)  Wetla	Secondary Inc.  Water-sta  X Drainage  Oxidized  Presence  Salt Depo  Stunted of  X Geomorp  Shallow A  X Microtopo  FAC-Neu  and Hydrology P	dicators (2 or more required) ained Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) sits (C5) or Stressed Plants (D1) chic Position (D2) aquitard (D3) ographic Relief (D4) tral Test (D5)  resent? Yes X No
Type:	drology Indicators: cators (any one indicators: cators (B2) coosits (B3) crust of Algae or Marionsits (B5)	ator is suf	ficient)  Surface Soil Cr Inundation Visil Sparsely Veget Hydrogen Sulfic Dry-Season Wa Other (Explain in  No X Depth No X Depth No X Depth onitoring well, aerial	ble on Aerial tated Concar de Odor (C1 ater Table (C n Remarks)  (inches): (inches): (inches): I photos, pre	ve Surface ) C2)	e (B8)  Wetla	Secondary Inc.  Water-sta  X Drainage  Oxidized  Presence  Salt Depo  Stunted of  X Geomorp  Shallow A  X Microtopo  FAC-Neu  and Hydrology P	dicators (2 or more required) sined Leaves (B9) Patterns (B10) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) sits (C5) or Stressed Plants (D1) chic Position (D2) squitard (D3) ographic Relief (D4) tral Test (D5)

Applicant/Owner: Alaska Department of Transporta	tion / Buskin R. State Recreat	tion Area	Borough/City: Kodiak	Island	Sampling D	ate: <u>9.12.0</u>
Prisone Strict. Addita Department of Hansporta	ion / Federal Aviation Adminis	stration			Sampling Po	int: B-2
nvestigator(s): M. Raad, T Johnson, R. Ruggiero			Landform (hillside, te	rrace, hum	nmocks, etc.)	slope
ocal relief (concave, convex, none): none	Slope	e (%):				
ubregion: Southcentral Alaska					Datum:	
re climatic / hydrologic conditions on the site typical						
re Vegetation, Soil, or Hydrology _						No
re Vegetation, Soil, or Hydrology _						140
UMMARY OF FINDINGS – Attach site	map showing sampling	ng point	locations, transe	cts, imp	ortant fea	tures, et
Hydrophytic Vegetation Present? Yes	No _X	ub - C I				
Hydric Soil Present? Yes	X No	the Sample thin a Wetla		/	N	
Wetland Hydrology Present? Yes	No _X_	nin a vvetia	na ?	res	No	<u>X</u>
Remarks:						
EGETATION  species (Use scientific names. List all species in p	Absolute					
W W W			Prevalence Index:			
. Agrostis capillaris . Alnus sinuata	10% 50%	FACU	Total % Cover of			
. Angelica lucida	100/	FACU FACU	OBL species			
. Epilobium angustifolium		FACU	FACW species			
. Geum macrophyllum		FAC	FACU species			
. Heracleum lanatum		FACU	UPL species			
. Picea sitchensis	30%	FACU	Column Totals: 20			
. Rubus spectabilis	30%	FACU	Prevalence Inc			
Salix scouleriana		FAC				
0				-		
1			Other Indicators of	Hydroph	ytic Vegetati	on:
			(Record supporting sheet.)	data in Rei	marks or on a	separate
3			Wetland Crypton	gams (reco	ord species a	nd cover
3 4			Wetland Crypton at left)	gams (reco	ord species a	nd cover
3 4 5			DOM: N			nd cover
3 4 5 6			at left)	daptations	5	
3			at left) Morphological A	daptations	5	
3			at left) Morphological A	daptations	5	
3			at left) Morphological A	daptations	5	
3			at left) Morphological A Problematic Hyc	daptations	5	
33	Total Cover:100%		at left) Morphological A	daptations	5	
2	Total Cover:100%_ % Bare Ground0%		at left) Morphological A Problematic Hyd  Hydrophytic Vegetation	daptations	5	xplain)

Depth Mate (inches) Color (mois	rix	epth needed to document the indicate  Redox Features  Color (moist) % Type		Texture Remarks
0-3" 10YR 2/1	100%			
		none		clay loam w/gravel course & 4" (max.) cobbles
3-16" 2.5YR 4/3	100%	10YR 5/3 inclusions		silty sand w/gravel, small and medium cobbles
16-18" 10YR 5/3		with large mottles of lighter sand w/lighter	ght staining	
<sup>1</sup> Type: C=Concentration, D=	Depletion, RI			RC=Root Channel, M=Matrix.
Hydric Soil Indicators:		Indicators for Problematic Hyd		
Histosol or Histel (A1)		Alaska Color Change (TA4) <sup>4</sup>		Alaska Gleyed Without Hue 5Y or Redder
Histic Epipedon (A2)		Alaska Alpine Swales (TA5)		Underlying Layer
Hydrogen Sulfide (A4)		Alaska Redox With 2.5Y Hue	9	Other (Explain in Remarks)
Thick Dark Surface (A12	)	3_		
Alaska Gleyed (A13)				primary indicator of wetland hydrology,
Alaska Redox (A14)	4.5.\	and an appropriate landscape		et be present.
Alaska Gleyed Pores (A Restrictive Layer (if presen		<sup>4</sup> Give details of color change in R	temarks.	
The same and the s				
Type:				I
Denth (inches):				Hydric Soil Present? Vec Y No
Depth (inches):Remarks:				Hydric Soil Present? Yes X No
				Hydric Soil Present? Yes X No
Remarks:				
Remarks: YDROLOGY	ors:	ficient)		Secondary Indicators (2 or more required)
Remarks:  YDROLOGY  Wetland Hydrology Indicate	ors:			Secondary Indicators (2 or more required)  Water-stained Leaves (B9)
Remarks:  YDROLOGY  Wetland Hydrology Indicate  Primary Indicators (any one i	ors:	fficient) Surface Soil Cracks (B6) Inundation Visible on Aerial Image	ery (B7)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)
YDROLOGY  Wetland Hydrology Indicate Primary Indicators (any one i Surface Water (A1)	ors:	Surface Soil Cracks (B6)	and the same of th	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)
YDROLOGY  Wetland Hydrology Indicate  Primary Indicators (any one i  Surface Water (A1)  High Water Table (A2)	ors:	Surface Soil Cracks (B6) Inundation Visible on Aerial Image	and the same of th	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3
YDROLOGY  Wetland Hydrology Indicate  Primary Indicators (any one i  Surface Water (A1)  High Water Table (A2)  Saturation (A3)	ors:	<ul><li>Surface Soil Cracks (B6)</li><li>Inundation Visible on Aerial Image</li><li>Sparsely Vegetated Concave Surf</li></ul>	and the same of th	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)
YDROLOGY  Wetland Hydrology Indicate  Primary Indicators (any one i  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)	ors: ndicator is sut	<ul> <li>Surface Soil Cracks (B6)</li> <li>Inundation Visible on Aerial Image</li> <li>Sparsely Vegetated Concave Surf</li> <li>Hydrogen Sulfide Odor (C1)</li> </ul>	and the same of th	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)
YDROLOGY  Netland Hydrology Indicate Primary Indicators (any one i Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or	ors: ndicator is sut	<ul> <li>Surface Soil Cracks (B6)</li> <li>Inundation Visible on Aerial Image</li> <li>Sparsely Vegetated Concave Surf</li> <li>Hydrogen Sulfide Odor (C1)</li> <li>Dry-Season Water Table (C2)</li> </ul>	and the same of th	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)
YDROLOGY  Wetland Hydrology Indicate  Primary Indicators (any one i  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)	ors: ndicator is sut	<ul> <li>Surface Soil Cracks (B6)</li> <li>Inundation Visible on Aerial Image</li> <li>Sparsely Vegetated Concave Surf</li> <li>Hydrogen Sulfide Odor (C1)</li> <li>Dry-Season Water Table (C2)</li> </ul>	and the same of th	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
YDROLOGY  Wetland Hydrology Indicate Primary Indicators (any one i Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or Iron Deposits (B5)	ors: ndicator is sut	<ul> <li>Surface Soil Cracks (B6)</li> <li>Inundation Visible on Aerial Image</li> <li>Sparsely Vegetated Concave Surf</li> <li>Hydrogen Sulfide Odor (C1)</li> <li>Dry-Season Water Table (C2)</li> </ul>	and the same of th	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
YDROLOGY  Wetland Hydrology Indicate Primary Indicators (any one i Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or Iron Deposits (B5)	ors: ndicator is sut	<ul> <li>Surface Soil Cracks (B6)</li> <li>Inundation Visible on Aerial Image</li> <li>Sparsely Vegetated Concave Surf</li> <li>Hydrogen Sulfide Odor (C1)</li> <li>Dry-Season Water Table (C2)</li> <li>Other (Explain in Remarks)</li> </ul>	face (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Primary Indicators (any one in Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or Iron Deposits (B5)  Field Observations: Surface Water Present?	ors: Indicator is suf Marl (B4)	Surface Soil Cracks (B6) Inundation Visible on Aerial Image Sparsely Vegetated Concave Surf Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Other (Explain in Remarks)  NoX Depth (inches):	face (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
YDROLOGY  Wetland Hydrology Indicate Primary Indicators (any one i Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or Iron Deposits (B5)  Field Observations: Surface Water Present?  Water Table Present?	ors: Indicator is sufficient (B4)  Yes Yes	Surface Soil Cracks (B6) Inundation Visible on Aerial Image Sparsely Vegetated Concave Surf Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Other (Explain in Remarks)  NoX Depth (inches): NoX Depth (inches):	face (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Primary Indicators (any one in Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Mat or Crust of Algae or Iron Deposits (B5)  Field Observations:  Surface Water Present?  Vater Table Present?  Saturation Present?  Saturation Present?	ors: Indicator is sufficient (B4)  Yes Yes Yes	Surface Soil Cracks (B6) Inundation Visible on Aerial Image Sparsely Vegetated Concave Surf Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Other (Explain in Remarks)  NoX Depth (inches):	face (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
YDROLOGY  Wetland Hydrology Indicate Primary Indicators (any one i Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or Iron Deposits (B5)  Field Observations: Surface Water Present? Vater Table Present? Saturation Present? Saturation Present? Sincludes capillary fringe) Describe Recorded Data (streen	ors: Indicator is sufficient (B4)  Yes Yes Yes	Surface Soil Cracks (B6) Inundation Visible on Aerial Image Sparsely Vegetated Concave Surf Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Other (Explain in Remarks)  NoX Depth (inches): NoX Depth (inches): NoX Depth (inches):	face (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Primary Indicators (any one in Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Mat or Crust of Algae or Iron Deposits (B5)  Field Observations:  Surface Water Present?  Vater Table Present?  Saturation Present?  Saturation Present?	ors: Indicator is sufficient (B4)  Yes Yes Yes	Surface Soil Cracks (B6) Inundation Visible on Aerial Image Sparsely Vegetated Concave Surf Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Other (Explain in Remarks)  NoX Depth (inches): NoX Depth (inches): NoX Depth (inches):	face (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
YDROLOGY  Wetland Hydrology Indicate Primary Indicators (any one i Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or Iron Deposits (B5)  Field Observations: Surface Water Present? Vater Table Present? Saturation Present? Saturation Present? Sincludes capillary fringe) Describe Recorded Data (streen	ors: Indicator is sufficient (B4)  Yes Yes Yes	Surface Soil Cracks (B6) Inundation Visible on Aerial Image Sparsely Vegetated Concave Surf Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Other (Explain in Remarks)  NoX Depth (inches): NoX Depth (inches): NoX Depth (inches):	face (B8)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

Project/Site: Kodiak Airport / Coast Guard Reservation / Busk	in R. State Recreati	on Area	Borough/City: Kodiak Isla	and Sampling Date: 9.13.0
Applicant/Owner: Alaska Department of Transportation / Feder				Sampling Point: _C-1
				e, hummocks, etc.):depression
Local relief (concave, convex, none): none				o, Hammooks, etc.). <u>depression</u>
Subregion: Southcentral Alaska Lat:				
Are climatic / hydrologic conditions on the site typical for this tir				
Are Vegetation, Soil, or Hydrology sign	ificantly disturbed?	Are	"Normal Circumstances"	present? Yes X No
Are Vegetation, Soil, or Hydrology natu				
SUMMARY OF FINDINGS - Attach site map sh	owing samplin	g point	locations, transects	, important features, etc.
Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No	IS III	e Sample		
Wetland Hydrology Present? Yes X No		in a Wetla	and? Yes	X No
Remarks:				
VEGETATION				
Species (Use scientific names. List all species in plot.)	Absolute	Indicator		
Agrostis capillaris	% Cover		Prevalence Index:	
Carex tenuiflora	20%	FACU OBL		Multiply by:
3. Eriophorum vaginatum			OBL species 20	
4. Hordeum brachyantherum		FACW	FACW species 60	
5. Plantago major		FACW FAC	FAC species 5 FACU species 20	
6. Taraxacum officinale		FACU		
7. Trifolium pratense		FAC	UPL species	(A) <u>235</u> (B)
8. mown grass		TAC		= B/A = <u>2.24</u>
9			Trevalence macx	- 5//2.24
10				
11			Other Indicators of Hyd	drophytic Vogetation:
12				in Remarks or on a separate
13			sheet.)	
14			Wetland Cryptogam	s (record species and cover
15			at left)	
16			Morphological Adap	
17			Problematic Hydrop	hytic Vegetation (Explain)
18				
19				
20				
Total	Cover:100%		Hydrophytic	
Plot size 1-meter radius % Bare 0	Fround 0%		Vegetation	V N-
% Cover of Wetland Bryophytes Total Cover of	Bryophytes		Present? Yes	X No
Remarks:				
Soil and hydrology from plot with vegetation from entire wetland	because vegetation	n was prin	narily mown grass lacking	seed heads
	3-100	per III	, graco laoking	. To a model.

Color (moist) % Color (moist) % Type¹ Loc² Texture Remark  Gley 1 4 N 100% Calor (moist) % Type¹ Loc² Texture Remark  Gley 1 4 N 100% Calor (moist) % Type¹ Loc² Texture Remark  Calor (moist) % Type¹ Loc² Texture Remark  Calor (moist) % Color (moist) % Type¹ Loc² Texture Remark  Calor (moist) % Color (moist) % Type¹ Loc² Texture Remark  Calor (moist) % Calor (moist) % Calor (moist) PlePere Lining, RC=Root Channel, M=Matrix.  Indicators for Problematic Hydric Soils³:  Alaska Color (hange (Tx4)⁴ Alaska Gleyed Without Hue 5Y Underlying Layer  Other (Explain in Remarks)  Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Redox (With 2.5Y Hue Degetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.  Alaska Gleyed Pores (A15) *Give details of color change in Remarks.  Restrictive Layer (if present):  Type:  Depth (inches):  Depth (inches):  Depth (inches):  Depth (inches):  Depth (inches):  Secondary Indicators (2 or more registered (moist) PlePere Lining, RC=Root Channel, M=Matrix.  Calor (moist)  Alaska Gleyed (Matrix)  Alaska Gleyed Pores (A15)  *Give details of color change in Remarks.  *Give details of color change	Profile Des	cription: (Describe	to the depth needed to d	ocument the i	ndicator.			Sampling Point: C-1
O-6" Gley 1 4 N 100% clay loam; mostly coarse gravel  Type: C=Concentration, D=Depletion, RM=Reduced Matrix. *Location: PL=Pore Lining, RC=Root Channel, M=Matrix.  Indicators for Problematic Hydric Soils*:  Histosol or Histel (A1) Alaska Color Change (TA4)* Alaska Gleyed Without Hue 5Y Hydrogen Sulfide (A4) Alaska Alpine Swales (TA5) Underlying Layer  Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Other (Explain in Remarks)  Thick Dark Surface (A12)  Alaska Gleyed (A13) *One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.  Restrictive Layer (if present):  Type:  Depth (inches):  Depth (inches):  Depth (inches):  Secondary Indicators: (2 or more regiminary Indicators (2) or more regiminary Indicators (3) or more regiminary Indicators (4) or more regiminary	Depth (inches)							
Type: C=Concentration, D=Depletion, RM=Reduced Matrix.    "Location: PL=Pore Lining, RC=Root Channel, M=Matrix.  "Indicators for Problematic Hydric Soils":  Histosol or Histel (A1)	(inches)	Color (moist)	% Color (mois	%	Type <sup>1</sup>	_Loc <sup>2</sup>	Texture	Remarks
Indicators for Problematic Hydric Soils <sup>3</sup> :  Histosol or Histel (A1)  Histic Epipedon (A2)  Hydrogen Sulfide (A4)  Thick Dark Surface (A12)  Alaska Gleyed (A13)  Alaska Redox With 2.5Y Hue  Other (Explain in Remarks)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.  Alaska Gleyed (If present):  Type:  Depth (inches):  Emarks:  Indicators for Problematic Hydric Soils <sup>3</sup> :  Alaska Gleyed (Na14)  Alaska Gleyed (Na15)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.  Give details of color change in Remarks.  Hydric Soil Present? Yes X  DROLOGY  etland Hydrology Indicators:  Secondary Indicators (2 or more required)	0-6"	Gley 1 4 N	100%				clay loam; mostly co	earse gravel
Type:	Hydric Soil I Histosol Histic Ep Hydroge Thick Da Alaska G Alaska G	or Histel (A1) pipedon (A2) en Sulfide (A4) ark Surface (A12) Gleyed (A13) Redox (A14) Gleyed Pores (A15)	Indicators  Alaska Alaska Alaska  _^ One indicat and an ap	or Problemati Color Change ( Alpine Swales ( Redox With 2.5 or of hydrophyt propriate lands	c Hydric (TA4) <sup>4</sup> (TA5) iY Hue tic vegetat scape posi	Soils <sup>3</sup> : ion, one tion mus	Alaska Gleyed	d Without Hue 5Y or Redder Layer n in Remarks)
/DROLOGY    Secondary Indicators (2 or more requirements)   Secondary Indicators (2 or more requirements)	Type: Depth (inc	75 to 5 = 2.23 to					Hydric Soil Presen	t? Yes X No
etland Hydrology Indicators:  Secondary Indicators (2 or more requirements)							•	
mary Indicators (any one indicators is sufficient)								
Motor state of the Motor state o			tor is sufficient'					
Surface Water (A1)  Surface Soil Cracks (B6)  Drainage Patterns (B10)			044 N XX XX XX	7			Water-stained I	_eaves (B9)

Wetland Hydrology Indicators:  Primary Indicators (any one indicator is so	ufficient)	Secondary Indicators (2 or more required)  Water-stained Leaves (B9)
Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or Marl (B4) Iron Deposits (B5)	<ul> <li>Surface Soil Cracks (B6)</li> <li>Inundation Visible on Aerial Imagery (B</li> <li>Sparsely Vegetated Concave Surface (I</li> <li>Hydrogen Sulfide Odor (C1)</li> <li>Dry-Season Water Table (C2)</li> <li>Other (Explain in Remarks)</li> </ul>	<ul> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> </ul>
Field Observations:		
Surface Water Present? Yes X	No Depth (inches):0"	
TAT :	No Depth (inches):0"	
	No Depth (inches):0"	Wetland Hydrology Present? Yes X No
Describe Recorded Data (stream gauge, n	nonitoring well, aerial photos, previous inspect	ions), if available:
Remarks:		
Iron sheen on water		

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration : Leandform (hillside, terrace, hummocks, etc.):line Load relief (concerv). Convex, none): page   Slope (%): Leandform (hillside, terrace, hummocks, etc.):line Load relief (concerv). Convex, none): page   Slope (%): Leandform (hillside, terrace, hummocks, etc.):line Load relief (concerv). Convex, none): page   Slope (%): Leandform (hillside, terrace, hummocks, etc.):line Load relief (concerv). Convex of the site typical for this time of year? Yes _X No (if no, explain in Remarks.)	Project/Site: Kodiak Airport / Coast Gua	rd Reservation / Buskin R. S	tate Recreat	ion Area	Borough/City: Kod	liak Island	Sampling D	ate: 9.13.07
Investigator(s): M. Baad. T Johnson. R. Rugglero Local relief (concave, convex, none): none								- International Property
Local releff (concave, convex, none): none Subregion: Southcentral Alaska Lat: Long: Datum: Datum: Are climated rybydrologic conditions on the site typical for this time of year? Yes_X_ No_ (If no, explain in Remarks.)  Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes_X_ Are Vegetation. Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)  SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important feature bydrophytic Vegetation Present? Yes_X_ No_ Is the Sampled Area within a Wetland? Yes_X_ No_ Yes_X_ Yes_X	Investigator(s): M. Raad, T Johnson, R.	. Ruggiero						
Subregion: Southcentral Alaska							AND THE STATE OF T	
Are climate / hydrologic conditions on the site hybrid for this time of year? Yes X No (If no, explain in Remarks.)  Are Vegetation Soll or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X Are "Normal Circumstances" present? Yes X No (If needed, explain any answers in Remarks.)  SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important feature in the feature of the feature in the sample of the feature in the wetland? Yes X No (If no, explain in ny answers in Remarks.)  SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important feature in the featur							Datum:	
Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)  SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important feature Hydrophytic Vegetation Present? Yes X No Is the Sampled Area within a Wetland? Yes X No Pemarks:  VEGETATION  Species (Use scientific names. List all species in plot.) Absolute Indicator % Cover Status. The FACU Species Southlife names. List all species in plot.) Absolute Indicator % Cover Of Multiply by: OBL Species (Use scientific names. List all species in plot.) Security of the fact of the fa								>
Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)  SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important feature that the sampled Area within a Wetland? Yes X No Wetland Hydrology Present? Yes X No Wetland? Yes X No Yes X No Yes X No Yes X Yes								No
SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important feature with the sampled Area within a Wetland? Yes X No Wetland hydrology Present? Yes X No Wetland? Yes X No Yes X No Wetland? Yes X No Yes X Yes								100
Hydrophytic Vegetation Present?   Yes   X   No   Weltand Hydrology Present?   Yes   X   No   Weltand?   Yes   X   No   Weltand Hydrology Present?   Yes   X   No   Weltand Hydrology Present?   Yes   X   No   Weltand Hydrophytic Vegetation (Explain Hydrophytic Vegetation Present?   Yes   X   No   Weltand Bryophytes   Total Cover of Bryophytes   Yes   X   No   Yes   X   Yes   X   No   Yes   X   Yes   X   No   Yes   Xes   Xe							5.	
Flydic Soil Present?   Yes X No   within a Wetland?   Yes X No   within a Wetland?   Yes X No   within a Wetland?   Yes X No	SUMMARY OF FINDINGS – At	tach site map showing	g samplir	ng point	locations, tran	sects, in	nportant fea	atures, etc
Flydic Soil Present?   Yes X No   within a Wetland?   Yes X No   within a Wetland?   Yes X No   within a Wetland?   Yes X No	Hydrophytic Vegetation Present?	Yes X No						
Absolute   Indicator   Species (Use scientific names, List all species in plot.)   Absolute   Indicator   Scover   Status   TR   FACU   Total % Cover of:   Multiply by:   Total % Cover of:   Total % Cover of:   Multiply by:   Total % Cover of:   Total % Cover			IS LI			V	V 11	
Absolute   Indicator   Ye Cover   Status   Prevalence Index:   Tall Species (Use scientific names. List all species in plot.)   Absolute   Multiply by:   Status   Prevalence Index:   Total 's Cover of:   Multiply by:   Description   Total 's Cover of:   Multiply by:   Total 's Cover of:   Total 's Cov		YesX No	WILL	iii a vvetia	inar	Yes	X No	
Absolute	Remarks:							
Species (Use scientific names. List all species in plot.)   1. Agrostis capillaris   TR   FACU   Total % Cover of Wetland Bryophytes   Total Cover of Bryophytes   Status   Transacuru chamissonis (ORL)   Carex stinata (ORL)   Juncus arcticus (ORL)   Juncu	/EGETATION							
1. Agrostis capillaris			Absolute	Indicator				
2. <u>Carex tenuiflora</u> 3. <u>Juncus alpinus</u> 10% OBL 4. <u>Taraxacum officinale</u> 5% FACU 5		species in plot.)	% Cover	Status				
3. Juncus alpinus				1000000				
4. <u>Taraxacum officinale</u> 5.								
FACU species   5								
Cover of Wetland Bryophytes Total Cover of Bryophytes Total Cover of Wetland Bryophytes Total Cover of Bryophytes								
Column Totals:105(A)120  Prevalence Index = B/A =1.14  Prevalence Index = B/A =1.14  Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a se sheet.)  Wetland Cryptogams (record species and at left)  Wetland Cryptogams (record species and at left)  Morphological Adaptations  Problematic Hydrophytic Vegetation (Explains)  Total Cover:100%								
8								
9								
10								
12								
sheet.)  Wetland Cryptogams (record species and of at left)  Morphological Adaptations  Problematic Hydrophytic Vegetation (Explains)  Total Cover: 100%  Hydrophytic Vegetation  Plot size 1-meter radius % Bare Ground 0%  Cover of Wetland Bryophytes Total Cover of Bryophytes  Remarks:  Additional species present in the wetland (but not in the plot) include Eriophroum chamissonis (OBL). Juncus arcticus (OBL).	11				Other Indicators	of Hydrop	ohytic Vegetat	ion:
Wetland Cryptogams (record species and at left)  at left)  Morphological Adaptations Problematic Hydrophytic Vegetation (Explains)  Total Cover: 100%  Plot size 1-meter radius % Bare Ground 0% Cover of Wetland Bryophytes Total Cover of Bryophytes  Remarks:  Additional species present in the wetland (but not in the plot) include Eriophroum chamissonis (OBL) Carex stinata (OBL) Juncus arcticus (OBL)						ng data in F	Remarks or on	a separate
at left)  Morphological Adaptations  Problematic Hydrophytic Vegetation (Explains)  Total Cover: 100%  Plot size 1-meter radius % Bare Ground 0%  Cover of Wetland Bryophytes Total Cover of Bryophytes  Remarks:  Additional species present in the wetland (but not in the plot) include Eriophroum chamissonis (OBL), Carex stinata (OBL), Juncus arcticus (OBL), Juncus (OB						otogams (re	ecord species a	and cover
Morphological Adaptations   Morphological Adaptations   Problematic Hydrophytic Vegetation (Explains)					11.2 -11.	3 (		
Total Cover: Hydrophytic Vegetation (Explain in the wetland (but not in the plot) include Eriophroum chamissonis (OBL). Carex stipata (OBL). Juncus arcticus (OBL). Juncus arcticus (OBL). Juncus arcticus (OBL). Juncus arcticus (OBL).					Morphologica	al Adaptatio	ons	
Total Cover:					Problematic I	Hydrophytic	Vegetation (E	xplain)
Total Cover:100%								
Total Cover:								
Total Cover:100%								
Plot size1-meter radius					Hydrophytic			
Cover of Wetland Bryophytes Total Cover of Bryophytes Present? Yes X No	Plot size1-meter radius	% Bare Ground	0%		Vegetation			
Remarks:  Additional species present in the wetland (but not in the plot) include Erjophroum chamissonis (OBL). Carex stipata (OBL). Juncus arcticus (OBL)					Present?	Yes	<u>XNo</u>	_
Additional species present in the wetland (but not in the plot) include <i>Eriophroum chamissonis</i> (OBL), <i>Carex stipata</i> (OBL), <i>Juncus arcticus</i> (O and <i>Juncus mertensianus</i> (OBL).			,		Ų			
	Additional species present in the wetland and <i>Juncus mertensianus</i> (OBL).	(but not in the plot) include E	Eriophroum o	chamissoni	s (OBL), Carex stipe	ata (OBL),	Juncus arcticus	s (OBL),

N	D	-
Sampline	a Point:	D-1

Depth Matr	LAC 4	Daday Fastina	~	
(inches) Color (moist		Redox Feature Color (moist) %	Type <sup>1</sup> Loc <sup>2</sup>	Texture Remarks
PARK PARKS				
	100%		<del></del>	silty gravel with silt
Transi O Commentation D	D. L. F. DM	21	- DI D 1::	P0 P (0)
<sup>1</sup> Type: C=Concentration, D= Hydric Soil Indicators:	Depletion, RM=	Indicators for Problemat		, RC=Root Channel, M=Matrix.
Histosol or Histel (A1)		Alaska Color Change	175	Alaska Glaved Without Hue 5V or Redder
Histic Epipedon (A2)		Alaska Color Change Alaska Alpine Swales		Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
Hydrogen Sulfide (A4)		Alaska Redox With 2.		Other (Explain in Remarks)
Thick Dark Surface (A12)	Ñ	_ Alaska nedox Will12.	or nue	Other (Explain III Remarks)
Alaska Gleyed (A13)	7	<sup>3</sup> One indicator of hydronby	dic vegetation on	e primary indicator of wetland hydrology,
Alaska Redox (A14)				
Alaska Gleyed Pores (A1	15)	and an appropriate land <sup>4</sup> Give details of color chan		ust be present.
Restrictive Layer (if present		GIVE GETAILS OF COLOR CHAIL	go in nemarks.	
	t).			
Type:				
Depth (inches):				Hydric Soil Present? Yes X No
YDROLOGY				
Wetland Hydrology Indicato				Secondary Indicators (2 or more required)
Wetland Hydrology Indicato Primary Indicators (any one in	ndicator is suffic	O-CONTINUE CONTINUE C		Secondary Indicators (2 or more required) Water-stained Leaves (B9)
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1)	ndicator is suffic	_ Surface Soil Cracks (B6)		Water-stained Leaves (B9) Drainage Patterns (B10)
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2)	ndicator is suffic	Surface Soil Cracks (B6) Inundation Visible on Aerial		Water-stained Leaves (B9) Drainage Patterns (B10)
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3)	ndicator is suffic	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar	ve Surface (B8)	Water-stained Leaves (B9) Drainage Patterns (B10)
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1)	ndicator is suffic	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Conca Hydrogen Sulfide Odor (C1	ve Surface (B8)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> </ul>
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	ndicator is suffic — — — —	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C	ve Surface (B8)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> </ul>
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	ndicator is suffic — — — — —	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Conca Hydrogen Sulfide Odor (C1	ve Surface (B8)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> </ul>
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or N	ndicator is suffic — — — — —	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C	ve Surface (B8)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> </ul>
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	ndicator is suffic — — — — —	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C	ve Surface (B8)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>X Microtopographic Relief (D4)</li> </ul>
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or M Iron Deposits (B5)	ndicator is suffic — — — — —	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C	ve Surface (B8)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> </ul>
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or March Incomplete (B5) Field Observations:	ndicator is suffic	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C	ve Surface (B8)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>X Microtopographic Relief (D4)</li> </ul>
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or N Iron Deposits (B5)  Field Observations: Surface Water Present?	Marl (B4)	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)	ve Surface (B8) ) C2)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>Microtopographic Relief (D4)</li> </ul>
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or N Iron Deposits (B5)  Field Observations: Surface Water Present?	Marl (B4)  Yes N Yes N	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)	ve Surface (B8) ) C2)	<ul> <li>Water-stained Leaves (B9)</li> <li>Drainage Patterns (B10)</li> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> <li>Salt Deposits (C5)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>Microtopographic Relief (D4)</li> <li>FAC-Neutral Test (D5)</li> </ul>
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or N Iron Deposits (B5)  Field Observations: Surface Water Present? Nater Table Present? Saturation Present? Includes capillary fringe)	Marl (B4)  Yes N Yes N Yes I	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)  O_X Depth (inches):	ve Surface (B8) ) C2)  Wet	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  cland Hydrology Present? Yes X No
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or N Iron Deposits (B5)  Field Observations: Surface Water Present? Nater Table Present? Saturation Present? Includes capillary fringe)	Marl (B4)  Yes N Yes N Yes I	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)  O_X Depth (inches):	ve Surface (B8) ) C2)  Wet	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  cland Hydrology Present? Yes _X No
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or Mator Deposits (B5)  Field Observations: Surface Water Present? Water Table Present? Saturation Present? Includes capillary fringe) Describe Recorded Data (streat	Marl (B4)  Yes N Yes N Yes I	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)  O_X Depth (inches):	ve Surface (B8) ) C2)  Wet	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) X Microtopographic Relief (D4) FAC-Neutral Test (D5)  cland Hydrology Present? Yes X No
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or Mator Deposits (B5)  Field Observations: Surface Water Present? Water Table Present? Saturation Present? Includes capillary fringe) Describe Recorded Data (streat	Marl (B4)  Yes N Yes N Yes I	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)  O_X Depth (inches):	ve Surface (B8) ) C2)  Wet	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  cland Hydrology Present? Yes X No
Wetland Hydrology Indicato Primary Indicators (any one in Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or N Iron Deposits (B5)  Field Observations: Surface Water Present? Nater Table Present? Saturation Present? Saturation Present? Includes capillary fringe) Describe Recorded Data (streat	Marl (B4)  Yes N Yes N Yes I	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)  O_X Depth (inches):	ve Surface (B8) ) C2)  Wet	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  cland Hydrology Present? Yes _X No
X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or M	Marl (B4)  Yes N Yes N Yes I	Surface Soil Cracks (B6) Inundation Visible on Aerial Sparsely Vegetated Concar Hydrogen Sulfide Odor (C1 Dry-Season Water Table (C Other (Explain in Remarks)  O_X Depth (inches):	ve Surface (B8) ) C2)  Wet	Water-stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Salt Deposits (C5) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) X Microtopographic Relief (D4) FAC-Neutral Test (D5)  cland Hydrology Present? Yes X No

Project/Site: Kodiak Airport / Coast Gua	ard Reservation / Buskin R. S	State Recrea	ition Area	Borough/City: Koo	liak Island	Sampling Date: <u>9.13.07</u>
Applicant/Owner: Alaska Department of						Sampling Point: D-2
Investigator(s): M. Raad, T Johnson, R						nummocks, etc.):
Local relief (concave, convex, none): no		Clon	o (9/ ).	Landionn (initiside	r, terrace,	iumnocks, etc.):
Subregion: Southcentral Alaska	Lat:	2022 20000	L	.ong:		Datum:
Are climatic / hydrologic conditions on th						
Are Vegetation, Soil, or H	-tydrology significant	tly disturbed				
Are Vegetation, Soil, or F			19 14	needed, explain any		
SUMMARY OF FINDINGS - At	tach site map showin	ıg sampli	ng point	locations, tran	sects, ir	nportant features, etc
Hydrophytic Vegetation Present?	Yes No _X	7.	nu ==			
Hydric Soil Present?	YesNo _X	15 (	the Sample			
Wetland Hydrology Present?	Yes No _X		hin a Wetl	and?	Yes	NoX
Remarks:						
Compacted gravel fill						
VEGETATION						
SI (II)		Absolute	Indicator			
Species (Use scientific names. List all s 1. Agrostis capillaris	species in plot.)	% Cover		Prevalence Inde		
		25%	FACU			Multiply by:
Alnus sinuata (mown)     Carex tenuiflora			FAC			x 1 = 15
			OBL			x 2 =
<u>Picea sitchensis (mown)</u> <u>Potentilla gracilis</u>			FACU			_ x 3 = <u>15</u>
0. 0			FAC			x 4 = <u>240</u>
7 Tarayacum officinala			500000			_ x 5 =
		25%	FACU	1		_ (A) <u>270</u> (B)
8. <u>moss</u> 9	12			Prevalence	Index = B	/A = <u>3.38</u>
10						
11				04111		1 27 17
12.				(Record supporting	of Hydron data in F	Phytic Vegetation: Remarks or on a separate
13				sheet.)	5	terriante er erra deparate
14		-		Wetland Cryp	togams (re	ecord species and cover
15				at left)		
16				Morphologica	( 2	
17				Problematic H	lydrophytic	Vegetation (Explain)
18		- 1				
19						
20						
	Total Cover:			Hydrophytic		
Plot size <u>1-meter radius</u>	% Bare Ground	0%		Vegetation Present?	V	V
% Cover of Wetland Bryophytes	Total Cover of Bryop	hytes		Fresentr	res	NoX
Remarks:						
nemans.						

Profile Descri	ption: (Describe	to the depth n	eeded to docu	ment the indicato	r.)		
Depth	Matrix		Redo	ox Features			
(inches)	Color (moist)	% (	Color (moist)	% Type <sup>1</sup>	_Loc <sup>2</sup>	Texture	Remarks
0-4" 1	0 YR 2/2	20% - the rer	maining 80% is	gravel		silty gravel	
<sup>1</sup> Type: C=Cond	centration, D=Dep			<sup>2</sup> Location: PL=Po		RC=Root Channel,	M=Matrix.
Histosol or				or Change (TA4) <sup>4</sup>		Alaska Gle	eyed Without Hue 5Y or Redder
Histic Epipe	The state of the s			ine Swales (TA5)		Underlyi	
	Sulfide (A4)			dox With 2.5Y Hue			olain in Remarks)
	Surface (A12)						
Alaska Gle			One indicator o	of hydrophytic vege	ation, one	primary indicator o	wetland hydrology,
Alaska Rec	dox (A14)		and an appro	priate landscape p	sition mus	at be present.	
Alaska Gle	yed Pores (A15)	- X	Give details of	color change in Re	marks.		
Restrictive Lay	/er (if present):						
Type:							
1 4 5 0							
Depth (inche	es):					Hydric Soil Pre	sent? Yes No _X
Depth (inche Remarks:			8			Hydric Soil Pre	sent? Yes No_X
Depth (inche Remarks: Compacted gra	vel fill					Hydric Soil Pre	sent? Yes No <u>X</u>
Depth (inche Remarks: Compacted gra	vel fill						cators (2 or more required)
Depth (inche Remarks: Compacted grave YDROLOG) Wetland Hydro	vel fill	ator is sufficient	)			Secondary Indi	
Depth (inche Remarks: Compacted grave YDROLOG) Wetland Hydro	vel fill  / ology Indicators: ors (any one indica		) Surface Soil Cra	cks (B6)		Secondary Indi	cators (2 or more required)
Depth (inche Remarks: Compacted grave)  YDROLOGY Wetland Hydro Primary Indicate Surface Wa	vel fill  Velogy Indicators: ors (any one indicator (A1)	_ s	urface Soil Cra	icks (B6) le on Aerial Imager	/ (B7)	Secondary Indi Water-stair Drainage F	cators (2 or more required) ned Leaves (B9)
Depth (inche Remarks: Compacted grav  YDROLOG) Wetland Hydro Primary Indicate Surface Wa	vel fill  vology Indicators: ors (any one indicator (A1) Table (A2)	S Ir	urface Soil Cra nundation Visibl			Secondary Indi Water-stair Drainage F Oxidized R	cators (2 or more required) ned Leaves (B9) Patterns (B10)
Depth (inche Remarks: Compacted grad  YDROLOGY Wetland Hydro Primary Indicate Surface Wa High Water	vel fill  vology Indicators: ors (any one indicater (A1) Table (A2) (A3)	S Ir S	urface Soil Cra nundation Visibl	le on Aerial Imager ted Concave Surfa		Secondary Indi Water-stair Drainage F Oxidized R	cators (2 or more required) ned Leaves (B9) l'atterns (B10) hizospheres on Living Roots (C3 of Reduced Iron (C4)
Depth (inche Remarks: Compacted grav  YDROLOG) Wetland Hydro Primary Indicate Surface Wa High Water Saturation ( Water Mark	vel fill  vology Indicators: ors (any one indicater (A1) Table (A2) (A3)	S Ir S H C	Burface Soil Cra nundation Visibl parsely Vegeta lydrogen Sulfide pry-Season Wat	le on Aerial Imager ited Concave Surfa e Odor (C1) ter Table (C2)		Secondary Indi  Water-stair  Drainage F  Oxidized R  Presence of Salt Depos	cators (2 or more required) ned Leaves (B9) ratterns (B10) hizospheres on Living Roots (C3 of Reduced Iron (C4) its (C5) Stressed Plants (D1)
Depth (inche Remarks: Compacted grav  YDROLOGY  Wetland Hydro  Primary Indicate  Surface Wa  High Water  Saturation (  Water Mark  Sediment D  Drift Deposi	vel fill  logy Indicators: ors (any one indicator (A1) Table (A2) (A3) (A3) (A3) (A3) (A3) (A3) (A3) (A3	S Ir S H D	Surface Soil Cra nundation Visible parsely Vegeta lydrogen Sulfide	le on Aerial Imager ited Concave Surfa e Odor (C1) ter Table (C2)		Secondary Indi  Water-stair  Drainage F  Oxidized R  Presence of Salt Depose Stunted or Geomorphi	cators (2 or more required) ned Leaves (B9) ratterns (B10) hizospheres on Living Roots (C3 of Reduced Iron (C4) its (C5) Stressed Plants (D1) c Position (D2)
Depth (inche Remarks: Compacted grav  YDROLOGY  Wetland Hydro Primary Indicate Surface Wa High Water Saturation ( Water Mark Sediment D Drift Deposi Mat or Crus	vel fill  vology Indicators: ors (any one indicater (A1) Table (A2) (A3) (A3) (A3) (A3) (A3) (A3) (A3) (A3	S Ir S H D	Burface Soil Cra nundation Visibl parsely Vegeta lydrogen Sulfide pry-Season Wat	le on Aerial Imager ited Concave Surfa e Odor (C1) ter Table (C2)		Secondary Indi  Water-stair  Drainage F  Oxidized F  Presence of Salt Depose Stunted or Geomorphi Shallow Ac	cators (2 or more required) ned Leaves (B9) latterns (B10) hizospheres on Living Roots (C3 of Reduced Iron (C4) its (C5) Stressed Plants (D1) c Position (D2) uitard (D3)
Depth (inche Remarks: Compacted graves)  IYDROLOGY  Wetland Hydro  Primary Indicate  Surface Water High Water  Saturation ( Water Mark  Sediment D  Drift Deposit	vel fill  vology Indicators: ors (any one indicater (A1) Table (A2) (A3) (A3) (A3) (A3) (A3) (A3) (A3) (A3	S Ir S H D	Burface Soil Cra nundation Visibl parsely Vegeta lydrogen Sulfide pry-Season Wat	le on Aerial Imager ited Concave Surfa e Odor (C1) ter Table (C2)		Secondary Indi  Water-stain  Drainage F  Oxidized R  Presence of Salt Depose Stunted or Geomorphi Shallow Ad	cators (2 or more required) ned Leaves (B9) ratterns (B10) hizospheres on Living Roots (C3 of Reduced Iron (C4) its (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4)
Depth (inche Remarks: Compacted graves)  IYDROLOGY  Wetland Hydro Primary Indicate Surface Water High Water Saturation ( Water Mark Sediment D Drift Deposi Mat or Crus	vel fill  velogy Indicators: ors (any one indicator (A1) Table (A2) (A3) (A3) (A3) (A3) (A3) (A3) (A3) (A3	S Ir S H D	Burface Soil Cra nundation Visibl parsely Vegeta lydrogen Sulfide pry-Season Wat	le on Aerial Imager ited Concave Surfa e Odor (C1) ter Table (C2)		Secondary Indi  Water-stain  Drainage F  Oxidized R  Presence of Salt Depose Stunted or Geomorphi Shallow Ad	cators (2 or more required) ned Leaves (B9) latterns (B10) hizospheres on Living Roots (C3 of Reduced Iron (C4) its (C5) Stressed Plants (D1) c Position (D2) uitard (D3)
Depth (inche Remarks: Compacted grad  IYDROLOGY  Wetland Hydro  Primary Indicate  Surface Wa  High Water  Saturation (  Water Mark  Sediment D  Drift Deposi  Mat or Crus	vel fill  logy Indicators: ors (any one indicater (A1) Table (A2) (A3) (S (B1) Deposits (B2) its (B3) st of Algae or Marl its (B5) ions:	S Ir S F C O	Burface Soil Cra nundation Visibl parsely Vegeta lydrogen Sulfide pry-Season Wat	le on Aerial Imager Ited Concave Surfa e Odor (C1) Iter Table (C2) Remarks)		Secondary Indi  Water-stain  Drainage F  Oxidized R  Presence of Salt Depose Stunted or Geomorphi Shallow Ad	cators (2 or more required) ned Leaves (B9) ratterns (B10) hizospheres on Living Roots (C3 of Reduced Iron (C4) its (C5) Stressed Plants (D1) c Position (D2) uitard (D3) raphic Relief (D4)

Saturation Present? Yes \_\_\_\_ No \_X \_\_ Depth (inches): \_\_\_\_ Wetland Hydrold (includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Alaska Version 12-20-2005

Wetland Hydrology Present? Yes \_\_\_ No \_X

Remarks:

Project/Site: Kodiak Airport / Coast Gua Applicant/Owner: Alaska Department of				Borough/City: Kodiak Island Sampling Date: 9.13.07
				Sampling Point: <u>E-1</u>
				_Landform (hillside, terrace, hummocks, etc.):linear depres
Local relief (concave, convex, none): non				
				ong: Datum:
Are climatic / hydrologic conditions on th				
				e "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or F	Hydrology naturally p	roblematic?	(If r	needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - At	tach site map showin	g samplir	ng point	locations, transects, important features, etc
Hydrophytic Vegetation Present?	Yes No _X		e 1885 19	
Hydric Soil Present?	Yes X No	IS t	he Sample	
Wetland Hydrology Present?	YesX No		nin a Wetla	and? Yes X No
Remarks:				
/EGETATION				
Species (Use scientific names. List all s	species in plot )	Absolute % Cover	Indicator	Prevalence Index:
	posico in proxy		FACU	Total % Cover of: Multiply by:
0. 4		0000000	FACU	OBL species x 1 =
0 4 " 1 11		2/		FACW species x 2 =
4. Calamagrostis canadensis		75%	FAC	FAC speciesx 3 =225
5. Epilobium angustifolium		10%	FACU	FACU species x 4 = _80
6moss		5%		UPL species x 5 =
7				Column Totals: 95 (A) 305 (B)
8				Prevalence Index = B/A = 3.21
9				
10				
11		-		Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate
		-		sheet.)
13				Wetland Cryptogams (record species and cover
14 15				at left)
15 16				Morphological Adaptations
17				Problematic Hydrophytic Vegetation (Explain)
18.				
19.				
20				
	Total Cover			Hydrophytic
Plot size 1-meter radius	% Bare Ground	d _0%		Vegetation Present? Yes No _ X
% Cover of Wetland Bryophytes	Total Cover of Bryon	ohytes		Trostiti Tos No X
Remarks:				

March 1997	20 PR 20 20 PR	Property of the second	-	
Sami	niina	Point:	F-1	

Color (moist)	(inches) Color (mo	atrix	Redox F				
B-12* Gley 1.4/10Y 100% clay and gravel  Type: C=Concentration, D=Depletion, RM=Reduced Matrix. **Location: PL=Pore Lining, RC=Reot Channel, M=Matrix.  Hydric Soil Indicators: Indicators for Problematic Hydric Soils*:  Histosol or Histel (A1)		ist) %	Color (moist)	% Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
Type: C=Concentration, D=Depletion, RM=Reduced Matrix. *Location: PL=Pore Lining, RC=Root Channel, M=Matrix.  Hydric Soil Indicators:  Histosol or Histel (A1)  Alaska Color Change (TA4)*  Alaska Schor Change (TA4)*  Alaska Gleyed Without Hue 5Y or Redder Underlying Layer  Hydrogen Suilfide (A4)  Alaska Redox With 2.5Y Hue  Other (Explain in Remarks)  One indicator of hydrophylic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.  Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Redox (A14)  Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Redox (A15)  *Give details of color change in Remarks.  *Restrictive Layer (if present):  Type:  Depth (inches):  Depth (inches):  *Secondary Indicators (2 or more required)  Water stained Leaves (B9)  Drainage Patterns (B10)  Alaska Gleyed Pores (A15)  *Secondary Indicators (2 or more required)  Water stained Leaves (B9)  Drainage Patterns (B10)  Water Table (R2)  Inundation Visible on Aerial Imagery (B7)  Sediment Deposits (B3)  Water Marks (B1)  Hydrogen Sulfide Odor (C1)  Sediment Deposits (B3)  Order (Explain in Remarks)  Alaska Color Change (B8)  Alaska Gleyed Without Hue 5Y or Redder  Hydric Soil Present?  Water Table (R2)  Surface Water (A1)  Sparsely Vegetated Concave Surface (B8)  Presence of Reduced Iron (C4)  Sait Deposits (B3)  Order (Explain in Remarks)  Alaska Color Change (B4)  Alaska Clove (B4)  Alaska Apine Swales (TA5)  Water Table (R2)  Surface Water Present?  Yes No Depth (inches):  Water Table Present? Yes No Depth (inches):  Water Table Present? Yes No	_0-8" Gley 1 4/10Y	1009	6			clay	few, faint
Type: C=Concentration, D=Depletion, RM=Reduced Matrix. *Location: PL=Pore Lining, RC=Root Channel, M=Matrix.  Hydric Soil Indicators:  Histosol or Histel (A1)  Alaska Color Change (TA4)*  Alaska Schor Change (TA4)*  Alaska Gleyed Without Hue 5Y or Redder Underlying Layer  Hydrogen Suilfide (A4)  Alaska Redox With 2.5Y Hue  Other (Explain in Remarks)  One indicator of hydrophylic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.  Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Redox (A14)  Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Redox (A15)  *Give details of color change in Remarks.  *Restrictive Layer (if present):  Type:  Depth (inches):  Depth (inches):  *Secondary Indicators (2 or more required)  Water stained Leaves (B9)  Drainage Patterns (B10)  Alaska Gleyed Pores (A15)  *Secondary Indicators (2 or more required)  Water stained Leaves (B9)  Drainage Patterns (B10)  Water Table (R2)  Inundation Visible on Aerial Imagery (B7)  Sediment Deposits (B3)  Water Marks (B1)  Hydrogen Sulfide Odor (C1)  Sediment Deposits (B3)  Order (Explain in Remarks)  Alaska Color Change (B8)  Alaska Gleyed Without Hue 5Y or Redder  Hydric Soil Present?  Water Table (R2)  Surface Water (A1)  Sparsely Vegetated Concave Surface (B8)  Presence of Reduced Iron (C4)  Sait Deposits (B3)  Order (Explain in Remarks)  Alaska Color Change (B4)  Alaska Clove (B4)  Alaska Apine Swales (TA5)  Water Table (R2)  Surface Water Present?  Yes No Depth (inches):  Water Table Present? Yes No Depth (inches):  Water Table Present? Yes No	8-12" Glev 1 4/10Y	100%				clav and grave	el
Hydric Soil Indicators: Indicators for Problematic Hydric Soils*:  Histosol or Histel (A1)	O 12 GICY 1 47 TO 1	1007	<u> </u>			oldy and grave	
Hydric Soil Indicators: Indicators for Problematic Hydric Soils*:  Histosol or Histel (A1)							
Hydric Soil Indicators: Indicators for Problematic Hydric Soils*:  Histosol or Histel (A1)							
Hydric Soil Indicators: Indicators for Problematic Hydric Soils*:  Histosol or Histel (A1)							
Hydric Soil Indicators: Indicators for Problematic Hydric Soils*:  Histosol or Histel (A1)							
Histosol or Histel (A1)		=Depletion, R				Root Channel,	M=Matrix.
Histic Epipedon (A2)							
Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Other (Explain in Remarks) Thick Dark Surface (A12) Alaska Gleyed (A13) and an appropriate landscape position must be present Alaska Redox (A14) and an appropriate landscape position must be present Alaska Gleyed Pores (A15) and an appropriate landscape position must be present	The second secon				-		
Thick Dark Surface (A12)  X Alaska Gleyed (A13)  Alaska Gleyed (A14)  Alaska Gleyed Pores (A15)  *Give details of color change in Remarks.  *Restrictive Layer (if present):  Type:  Depth (inches):  Type:  Depth (inches):  Remarks:   **Wetland Hydrology Indicators:  Primary Indicators (any one indicator is sufficient)  Surface Soil Cracks (B6)  X High Water Table (A2)  Inundation Visible on Aerial Imagery (B7)  Water Stalined Leaves (B9)  Presence of Reduced Iron (C4)  Saturation (A3)  Sparsely Vegetated Concave Surface (B8)  Presence of Reduced Iron (C4)  Sediment Deposits (B3)  Mat or Crust of Algae or Marl (B4)  Iron Deposits (B3)  Other (Explain in Remarks)  Alaska Reduced A12)  Surface Water Present?  Yes No Depth (inches):  Secondary Indicators (2 or more required)  Water Table (C2)  Stall Deposits (B3)  Other (Explain in Remarks)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)  Field Observations:  Surface Water Present?  Yes No Depth (inches):  Surface Water Present?  Yes No Depth (inches):  Saturation Present?  Yes No Depth (inches):  Saturation Present?  Yes No Depth (inches):  Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:							
Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15)  Restrictive Layer (if present): Type: Depth (inches): Depth (inches):  Beth (inches): Depth (inches):  Beth (inch		(2)	Alaska nedox v	viui 2.51 Flue	-	Other (EX	piain in nemarks)
Alaska Redox (A14) Alaska Gleyed Pores (A15) Alaska Gleyed Present. Alaska Gleyed Pores (A15) Alaska Gleyed Present. Alaska Gleyed Pores (A15) Alaska Gleyed Present. Alaska Cleyed Present. Alaska		-1	<sup>3</sup> One indicator of hv	drophytic vegetatio	n, one prim	ary indicator o	of wetland hydrology.
Alaska Gleyed Pores (A15)  Restrictive Layer (if present): Type:	ACCUPATION OF THE PROPERTY OF			The second secon	STATE STATES OF THE STATES OF		The state of the Control of the state of the
Type:	Alaska Gleyed Pores (/	415)	A:				
Depth (inches):	Restrictive Layer (if prese	nt):					
Primary Indicators (2 or more required)  Wetland Hydrology Indicators:  Primary Indicators (any one indicator is sufficient)  Surface Water (A1)  Water-stained Leaves (B9)  Surface Water (A1)  Water Table (A2)  Inundation Visible on Aerial Imagery (B7)  Water Marks (B1)  Water Marks (B1)  Hydrogen Sulfide Odor (C1)  Salt Deposits (C5)  Sediment Deposits (B2)  Drift Deposits (B3)  Mat or Crust of Algae or Marl (B4)  Iron Deposits (B5)  Water Present?  Yes  No  Depth (inches):  Saltration Present?  Yes  X  No  Depth (inches):  Secondary Indicators (2 or more required)  Water-stained Leaves (B9)  Drainage Patterns (B10)  Oxidized Rhizospheres on Living Roots (C3)  All Deposits (B10)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Salt	Type:						
YDROLOGY         Wetland Hydrology Indicators:       Secondary Indicators (2 or more required)         Primary Indicators (any one indicator is sufficient)	Depth (inches):				H	ydric Soil Pre	esent? Yes X No
Primary Indicators (any one indicator is sufficient)  Surface Water (A1)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  X High Water Table (A2)  Inundation Visible on Aerial Imagery (B7)  X Saturation (A3)  Sparsely Vegetated Concave Surface (B8)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  Sediment Deposits (B2)  Drift Deposits (B3)  Other (Explain in Remarks)  Iron Deposits (B5)  Water Observations:  Surface Water Present?  Yes No Depth (inches):  Saturation Present?  Yes X No Depth (inches):  Saturation Present?  Yes X No Depth (inches):  Secribe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		•					
Surface Water (A1)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  X High Water Table (A2)  Inundation Visible on Aerial Imagery (B7)  Saturation (A3)  Sparsely Vegetated Concave Surface (B8)  Presence of Reduced Iron (C4)  Water Marks (B1)  Hydrogen Sulfide Odor (C1)  Sediment Deposits (B2)  Drift Deposits (B3)  Other (Explain in Remarks)  Mat or Crust of Algae or Marl (B4)  Iron Deposits (B5)  Surface Water Present?  Yes  No  Depth (inches):  Water Table Present?  Yes  X  No  Depth (inches):  Other (inche			fficient\		5	Section 1 and 1 and 1	/ 1500
Migh Water Table (A2)		indicator is su		(P6)			
						Drainage	A DANCESTANIA CONTROL STOP AND THE STOP AND
Water Marks (B1)	The Control of the Co		Inundation Visible on	Aprial Imagary (R	7)	Ovidized F	Phiznenharas on Living Roots 103
Drift Deposits (B3) Other (Explain in Remarks) X _ Geomorphic Position (D2) Mat or Crust of Algae or Marl (B4) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5) FAC-Neutral Test (D5) Surface Water Present? Yes NoX Depth (inches): No Depth (inches): Saturation Present? YesX No Depth (inches): O" Wetland Hydrology Present? YesX No Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	X High Water Table (A2)						
Mat or Crust of Algae or Marl (B4) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5) FAC-Neutral Test (D5) Staturation Present? Yes No Depth (inches):	X High Water Table (A2) X Saturation (A3)		Sparsely Vegetated	Concave Surface (E		_ Presence	of Reduced Iron (C4)
Iron Deposits (B5)	X High Water Table (A2) X Saturation (A3) Water Marks (B1)		<ul><li>Sparsely Vegetated 0</li><li>Hydrogen Sulfide Od</li></ul>	Concave Surface (Flor (C1)		_ Presence _ Salt Depos	of Reduced Iron (C4) sits (C5)
FAC-Neutral Test (D5)  Field Observations:  Surface Water Present? Yes NoX Depth (inches):  Water Table Present? YesX No Depth (inches):  Saturation Present? YesX No Depth (inches):  includes capillary fringe)  Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2)		Sparsely Vegetated 0 Hydrogen Sulfide Od Dry-Season Water Ta	Concave Surface (B lor (C1) able (C2)	B8)	Presence Salt Depos Stunted or	of Reduced Iron (C4) sits (C5) Stressed Plants (D1)
Field Observations:  Surface Water Present? Yes No _X Depth (inches):  Water Table Present? Yes _X _ No Depth (inches): _4-6"  Saturation Present? Yes _X _ No Depth (inches): _0" Wetland Hydrology Present? Yes _X _ No  includes capillary fringe)  Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or	)	Sparsely Vegetated 0 Hydrogen Sulfide Od Dry-Season Water Ta	Concave Surface (B lor (C1) able (C2)	B8)	Presence Salt Depos Stunted or X Geomorph Shallow A	of Reduced Iron (C4) sits (C5) Stressed Plants (D1) nic Position (D2) quitard (D3)
Surface Water Present? Yes No _X Depth (inches):  Water Table Present? Yes _X No Depth (inches): _4-6"  Saturation Present? Yes _X No Depth (inches): _0" Wetland Hydrology Present? Yes _X No  includes capillary fringe)  Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or	)	Sparsely Vegetated 0 Hydrogen Sulfide Od Dry-Season Water Ta	Concave Surface (B lor (C1) able (C2)	B8)	Presence Salt Depose Stunted or X Geomorph Shallow Additional Microtopoge	of Reduced Iron (C4) sits (C5) Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4)
Nater Table Present? Yes X No Depth (inches): 4-6"  Saturation Present? Yes X No Depth (inches): 0" Wetland Hydrology Present? Yes X No includes capillary fringe)  Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae of Iron Deposits (B5)	)	Sparsely Vegetated 0 Hydrogen Sulfide Od Dry-Season Water Ta	Concave Surface (B lor (C1) able (C2)	B8)	Presence Salt Depose Stunted or X Geomorph Shallow Additional Microtopoge	of Reduced Iron (C4) sits (C5) Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4)
Saturation Present? Yes X No Depth (inches): 0" Wetland Hydrology Present? Yes X No Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae of Iron Deposits (B5)  Field Observations:	) r Marl (B4)	Sparsely Vegetated ( Hydrogen Sulfide Od Dry-Season Water To Other (Explain in Ren	Concave Surface (for (C1) able (C2) narks)	B8)	Presence Salt Depose Stunted or X Geomorph Shallow Additional Microtopoge	of Reduced Iron (C4) sits (C5) Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4)
includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae of Iron Deposits (B5)  Field Observations: Surface Water Present?	) r Marl (B4) Yes	Sparsely Vegetated ( Hydrogen Sulfide Od Dry-Season Water To Other (Explain in Ren	Concave Surface (tolor (C1) able (C2) marks)	B8)	Presence Salt Depose Stunted or X Geomorph Shallow Additional Microtopoge	of Reduced Iron (C4) sits (C5) Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4)
	X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or Iron Deposits (B5)  Field Observations: Surface Water Present? Water Table Present?	r Marl (B4)  Yes YesX	Sparsely Vegetated ( Hydrogen Sulfide Od Dry-Season Water To Other (Explain in Ren No Depth (inches	Concave Surface (Bor (C1) able (C2) marks) es):	B8)	Presence Salt Depos Stunted or X Geomorph Shallow Ad Microtopos FAC-Neutr	of Reduced Iron (C4) sits (C5) Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) ral Test (D5)
Remarks:	X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae of Iron Deposits (B5)  Field Observations: Surface Water Present? Water Table Present? Saturation Present?	r Marl (B4)  Yes YesX	Sparsely Vegetated ( Hydrogen Sulfide Od Dry-Season Water To Other (Explain in Ren No Depth (inches	Concave Surface (Bor (C1) able (C2) marks) es):	B8)	Presence Salt Depos Stunted or X Geomorph Shallow Ad Microtopos FAC-Neutr	of Reduced Iron (C4) sits (C5) Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) ral Test (D5)
terraine.	X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae of Iron Deposits (B5)  Field Observations: Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe)	Yes YesX Yes _X	Sparsely Vegetated ( Hydrogen Sulfide Od Dry-Season Water To Other (Explain in Ren No Depth (inche No Depth (inche No Depth (inche	Concave Surface (for (C1) able (C2) marks)  es):es):es):es):es):es):es):es):es):es):es	B8)	Presence Salt Depos Stunted or X Geomorph Shallow Addition Microtopos FAC-Neutr	of Reduced Iron (C4) sits (C5) Stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) ral Test (D5)
	X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae of Iron Deposits (B5)  Field Observations: Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe) Describe Recorded Data (st	Yes YesX Yes _X	Sparsely Vegetated ( Hydrogen Sulfide Od Dry-Season Water To Other (Explain in Ren No Depth (inche No Depth (inche No Depth (inche	Concave Surface (for (C1) able (C2) marks)  es):es):es):es):es):es):es):es):es):es):es	B8)	Presence Salt Depos Stunted or X Geomorph Shallow Addition Microtopos FAC-Neutr	of Reduced Iron (C4) sits (C5) stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) ral Test (D5)
	X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae of Iron Deposits (B5)  Field Observations: Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe) Describe Recorded Data (st	Yes YesX Yes _X	Sparsely Vegetated ( Hydrogen Sulfide Od Dry-Season Water To Other (Explain in Ren No Depth (inche No Depth (inche No Depth (inche	Concave Surface (for (C1) able (C2) marks)  es):es):es):es):es):es):es):es):es):es):es	B8)	Presence Salt Depos Stunted or X Geomorph Shallow Addition Microtopos FAC-Neutr	of Reduced Iron (C4) sits (C5) stressed Plants (D1) nic Position (D2) quitard (D3) graphic Relief (D4) ral Test (D5)

Project/Site: Kodiak Airport / Coast Guard Re	servation / Buskin R. Sta	ate Recrea	tion Area	Borough/City: Kodiak	Island	Sampling Date: 9.13.07
Applicant/Owner: Alaska Department of Trans	portation / Federal Aviat	tion Admin				Sampling Point: _E-2
Investigator(s): M. Raad, T Johnson, R. Ruge	giero					
Local relief (concave, convex, none): none						
						D. 1
Subregion: Southcentral Alaska						
Are climatic / hydrologic conditions on the site						
Are Vegetation, Soil, or Hydrol						
Are Vegetation, Soil, or Hydrol	ogy naturally pro	oblematic?	' (If r	eeded, explain any an	swers in	Remarks.)
SUMMARY OF FINDINGS – Attach	site map showing	sampli	ng point	locations, transe	cts, im	portant features, et
Hydrophytic Vegetation Present? Yes	s No_X_					
			the Sample			
	s No_X	Wi	thin a Wetla	ind?	res	NoX
Remarks:						
VEGETATION						
Species (Use scientific names. List all specie	on in plot \	Absolute		B 1 1 1 1		
4 4 1 20 20 20 20		% Cover	500 Street, U.	Prevalence Index:		NA JAS-1 - L
O Agrantia annillaria		25% 40%	FACU			Multiply by:
2 America trade		2227	FACU	OBL species		
4. Calamagrostis canadensis			FACU FAC	FACW species		
5. Epilobium angustifolium			FACU	FACU species		
6. Solidago canadensis			FACU	UPL species		Account to the second s
7. Trifolium pratense			FAC	Column Totals:		AND THE PARTY OF T
8 <i>moss</i>			IS?			A = 3.95
9				(10,100,100,100		
10						
11				Other Indicators of	Hydrop	hytic Vegetation:
12				(Record supporting of		emarks or on a separate
13				sheet.)		
14				STATE STATE	gams (re	cord species and cover
15				at left)	dontatio	
16				Morphological A		Vegetation (Explain)
17				Problematic Hyd	порпуцс	vegetation (Explain)
18						
19						
20						
	Total Cover:	100%		Hydrophytic		
Plot size 1-meter radius		0%		Vegetation Present?	/es	NoX
% Cover of Wetland Bryophytes	Total Cover of Bryoph	nytes				
Remarks:						

Profile De	scription: (Describe	to the den	th needed to docu	ment the ir	ndicator	1		
Depth	Matrix	to the dep		x Features		l:		
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	_Loc2	Texture	Remarks
0-3"	Gley 1 4/10Y	100%	none			_	large gravel with	clay
3-16"	Gravel fill layer						:	
	-							
lydric Soi	Concentration, D=Depl	etion, RM=	Indicators for F	roblemati	c Hydric	Lining, R	C=Root Channel, Ma	
Hydric Soi Histoso	il Indicators: ol or Histel (A1)	etion, RM=	Indicators for F	<b>Problemati</b> or Change (	c Hydric (TA4) <sup>4</sup>	Lining, R	Alaska Gleye	ed Without Hue 5Y or Redder
lydric Soi Histoso Histic B	il Indicators: ol or Histel (A1) Epipedon (A2)	etion, RM=	Indicators for F Alaska Colo Alaska Alpii	Problemation Change ( ne Swales (	c Hydric (TA4) <sup>4</sup> (TA5)	Lining, R Soils³:	Alaska Gleye Underlying	ed Without Hue 5Y or Redder Layer
Hydric Soi Histoso Histic E Hydrog	il Indicators: ol or Histel (A1) Epipedon (A2) gen Sulfide (A4)	etion, RM=	Indicators for F	Problemation Change ( ne Swales (	c Hydric (TA4) <sup>4</sup> (TA5)	E Lining, R	Alaska Gleye Underlying	ed Without Hue 5Y or Redder
Hydric Soi Histoso Histic B Hydrog Thick D	il Indicators: ol or Histel (A1) Epipedon (A2)	etion, RM=	Indicators for F Alaska Colo Alaska Alpin Alaska Red	Problemation Change ( the Swales ( tox With 2.5	c Hydric (TA4) <sup>4</sup> (TA5) SY Hue	Soils <sup>3</sup> :	Alaska Gleye Underlying Other (Explai	ed Without Hue 5Y or Redder Layer in in Remarks)
Hydric Soi Histoso Histic E Hydrog Thick E Alaska	il Indicators: ol or Histel (A1) Epipedon (A2) gen Sulfide (A4) Dark Surface (A12)	etion, RM=	Indicators for F Alaska Colo Alaska Alpin Alaska Red	Problemation Change ( The Swales ( The Swale	c Hydric (TA4) <sup>4</sup> (TA5) iY Hue	Soils <sup>3</sup> : tion, one p	Alaska Gleye	ed Without Hue 5Y or Redder Layer in in Remarks)
Hydric Soi Histoso Histic E Hydrog Thick E Alaska Alaska	il Indicators: ol or Histel (A1) Epipedon (A2) gen Sulfide (A4) Dark Surface (A12) Gleyed (A13)	etion, RM=	Indicators for F Alaska Colo Alaska Alpii Alaska Red  3One indicator o	Problemation Change ( the Swales ( tox With 2.5 f hydrophytoriate lands	c Hydric (TA4) <sup>4</sup> (TA5) SY Hue tic vegeta scape pos	Soils <sup>3</sup> : tion, one p	Alaska Gleye	ed Without Hue 5Y or Redder Layer in in Remarks)
Hydric Soi Histoso Histic E Hydrog Thick E Alaska Alaska Alaska	il Indicators: ol or Histel (A1) Epipedon (A2) gen Sulfide (A4) Dark Surface (A12) Gleyed (A13) Redox (A14)	etion, RM=	Indicators for F Alaska Colo Alaska Alpii Alaska Red  3One indicator o and an appro	Problemation Change ( the Swales ( tox With 2.5 f hydrophytoriate lands	c Hydric (TA4) <sup>4</sup> (TA5) SY Hue tic vegeta scape pos	Soils <sup>3</sup> : tion, one p	Alaska Gleye	ed Without Hue 5Y or Redder Layer in in Remarks)
Hydric Soi Histoso Histic E Hydrog Thick E Alaska Alaska Alaska Restrictive	il Indicators: ol or Histel (A1) Epipedon (A2) gen Sulfide (A4) Dark Surface (A12) Gleyed (A13) Redox (A14) Gleyed Pores (A15)		Indicators for F  Alaska Colo Alaska Alpin Alaska Red	Problemation Change ( the Swales ( tox With 2.5 f hydrophytoriate lands	c Hydric (TA4) <sup>4</sup> (TA5) SY Hue tic vegeta scape pos	Soils <sup>3</sup> : tion, one p	Alaska Gleye	ed Without Hue 5Y or Redder Layer in in Remarks)

HYDROLOGY				
Wetland Hydrology Indica	ators:			Secondary Indicators (2 or more required)
Primary Indicators (any one	e indicator is	sufficient)		Water-stained Leaves (B9)
<ul> <li>Surface Water (A1)</li> <li>High Water Table (A2)</li> <li>Saturation (A3)</li> <li>Water Marks (B1)</li> <li>Sediment Deposits (B2)</li> <li>Drift Deposits (B3)</li> <li>Mat or Crust of Algae of Iron Deposits (B5)</li> </ul>	:)	Inunda Sparse Hydrog Dry-Se	e Soil Cracks (B6) ation Visible on Aerial Image ely Vegetated Concave Surfa gen Sulfide Odor (C1) eason Water Table (C2) Explain in Remarks)	
Field Observations:				
Surface Water Present?	Yes	NoX	_ Depth (inches):	
Water Table Present?	Yes	No X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	NoX	Depth (inches):	Wetland Hydrology Present? Yes No _X
Describe Recorded Data (st	tream gauge	, monitoring we	ell, aerial photos, previous in	inspections), if available:
Remarks:				

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Investigator(s): M. Raad, T Johnson, R. Ruggiero  Local relief (concave, convex, none): none  Subregion: Southcentral Alaska Lat:	Slope Ir? Yes _ disturbed?	(If r	_Landform (hillside	, terrace, hu	Sampling Point: <u>F-1</u> ummocks, etc.): <u>depression</u> Datum:
Local relief (concave, convex, none): none  Subregion: Southcentral Alaska	Slope ar? Yes disturbed? olematic?	(If r	ong: (If no, exp	olain in Rem	Datum:
Local relief (concave, convex, none): none  Subregion: Southcentral Alaska Lat:	Slope ar? Yes disturbed? olematic?	(If r	ong: (If no, exp	olain in Rem	Datum:
Subregion: Southcentral Alaska Lat:  Are climatic / hydrologic conditions on the site typical for this time of yea Are Vegetation, Soil, or Hydrology significantly down Are Vegetation, Soil, or Hydrology naturally probest SUMMARY OF FINDINGS — Attach site map showing substituting the state of the site of	r? Yes _ listurbed? olematic?	X No	ong: (If no, exp	olain in Rem	Datum:
Are climatic / hydrologic conditions on the site typical for this time of year Are Vegetation, Soil, or Hydrology significantly do Are Vegetation, Soil, or Hydrology naturally probest SUMMARY OF FINDINGS — Attach site map showing sometimes are supported by the site of the site	r? Yes _ listurbed? blematic?	X No	(If no, exp	olain in Rem	Datum
Are Vegetation, Soil, or Hydrology significantly do Are Vegetation, Soil, or Hydrology naturally probest SUMMARY OF FINDINGS — Attach site map showing start the Hydrophytic Vegetation Present? YesX No	listurbed? blematic?	Are (If r			
Are Vegetation, Soil, or Hydrology naturally prob  SUMMARY OF FINDINGS – Attach site map showing s  Hydrophytic Vegetation Present? YesX No	lematic?	(If r	"Normal Circumsta		
SUMMARY OF FINDINGS – Attach site map showing s  Hydrophytic Vegetation Present? Yes X No		25			
Hydrophytic Vegetation Present? Yes X No	samplir		needed, explain any		
The state of the s		ng point	locations, tran	sects, in	nportant features, et
		he Sample			
Wetland Hydrology Present? Yes X No	With	hin a Wetla	ind?	Yes	X No
Remarks:  Non-wetland areas are dominated by rock and shale piles with little veg	getation (r	noss and a	lder only) Significa	nt disturban	ice adjacent to wetland is
evident.			, acrossing a significa	in diotarbar	oo dojdooni to welland is
/EGETATION					
and the state of t	Absolute	Indicator			
		Status	Prevalence Inde	ex:	
1. Agrostis capillaris	TR	FACU	Total % Cov	er of:	Multiply by:
2. Alnus sinuata	15%	FAC			x 1 = 90
3. <u>Calamagrostis canadensis</u>	20%	FAC	1000		x 2 = _20
4. Carex lenticularis var. lipocarpa	25%	OBL			x 3 = 135
5. Carex sitchensis	5%	OBL			x 4 =
6. <u>Eleocharis ovata</u>	30%	OBL	UPL species		x 5 =
7. <u>Eleocharis palustris</u>	30%	OBL			_ (A) <u>245</u> (B)
8. <u>Equisetum hyemale</u>	10%	FACW			A = <u>1.69</u>
9. <u>Juncus arcticus</u>	TR	OBL			
10. Salix sitchensis	10%	_FAC_			
11			Other Indicators	of Hydrop	hytic Vegetation:
12			(Record supportir sheet.)	ng data in R	emarks or on a separate
13				otogams (re	cord species and cover
14			at left)	3-110 (10	osia specios una cover
15			Morphologica	l Adaptation	ns
[6	-			2	Vegetation (Explain)
7			A State of the sta		J,
[8					
19					
20 Total Cover:1					
Plot size			Hydrophytic Vegetation		
6 Cover of Wetland Bryophytes Total Cover of Bryophyte			Present?	Yes X	No
Remarks:				-	

Profile Description: (Des	cribe to the de	pth needed to doo	ument the indicator.	)		
Depth Ma	atrix	Re	dox Features	7		
(inches) Color (moi	st) %	Color (moist)	%Type <sup>1</sup>	Loc <sup>2</sup>	<u>Texture</u>	Remarks
0-4" Gley 1 5/10Y	_100%	none			silty clay	
>4"				_	coarse gravels	
Type: C=Concentration, D	=Depletion, RM		<sup>2</sup> Location: PL=Pore		RC=Root Channel, N	Л=Matrix.
lydric Soil Indicators:			r Problematic Hydric	Soils':		
Histosol or Histel (A1)			olor Change (TA4)4		The second second second	yed Without Hue 5Y or Redder
_ Histic Epipedon (A2)			pine Swales (TA5)		Underlyin	(27) (2)
_ Hydrogen Sulfide (A4)		Alaska R	edox With 2.5Y Hue		Other (Exp	ain in Remarks)
_ Thick Dark Surface (A1	2)					
_ Alaska Gleyed (A13)			of hydrophytic vegeta			wetland hydrology,
_ Alaska Redox (A14)			ropriate landscape pos		t be present.	
_ Alaska Gleyed Pores (A	A15)	<sup>4</sup> Give details of	of color change in Rem	arks.		
estrictive Layer (if prese	nt):					
Type:		<u> </u>				
Depth (inches):					Hydric Soil Pres	sent? Yes X No
Remarks:						
YDROLOGY						
/DROLOGY /etland Hydrology Indica					Secondary Indic	ators (2 or more required)
/DROLOGY /etland Hydrology Indica rimary Indicators (any one		ricient)			Secondary Indic	ators (2 or more required) ed Leaves (B9)
'DROLOGY  /etland Hydrology Indical rimary Indicators (any one _ Surface Water (A1)		ficient) Surface Soil C			Secondary Indic Water-stain Drainage Pa	ators (2 or more required) ed Leaves (B9) atterns (B10)
'DROLOGY  'etland Hydrology Indicatrimary Indicators (any one  Surface Water (A1)  High Water Table (A2)		ficient) Surface Soil C Inundation Visi	ble on Aerial Imagery		Secondary Indic  Water-stain  Drainage Pounds	ators (2 or more required) ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3)
'DROLOGY  /etland Hydrology Indicat rimary Indicators (any one _ Surface Water (A1) _ High Water Table (A2) _ Saturation (A3)		ficient) Surface Soil C Inundation Visi Sparsely Vege	ble on Aerial Imagery tated Concave Surface		Secondary Indic  Water-stain  Drainage Pa  Oxidized Ri  Presence o	ators (2 or more required) ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3) f Reduced Iron (C4)
'DROLOGY  Vetland Hydrology Indicatorimary Indicators (any one  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)	indicator is suff	ficient) Surface Soil C Inundation Visi Sparsely Vege Hydrogen Sulfi	ble on Aerial Imagery tated Concave Surface de Odor (C1)		Secondary Indic  Water-stain  Drainage Pour Oxidized Rich  Presence of Salt Deposi	ators (2 or more required) ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3) f Reduced Iron (C4) ts (C5)
TOROLOGY  Tetland Hydrology Indicator (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	indicator is suff	ficient)  Surface Soil C Inundation Visi Sparsely Vege Hydrogen Sulfi	ble on Aerial Imagery tated Concave Surface de Odor (C1) ater Table (C2)		Secondary Indic  Water-stain  Drainage P.  Oxidized Ri  Presence or  Salt Deposi	ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3) f Reduced Iron (C4) ts (C5) Stressed Plants (D1)
/DROLOGY //etland Hydrology Indicarrimary Indicators (any one _ Surface Water (A1) _ High Water Table (A2) _ Saturation (A3) _ Water Marks (B1) _ Sediment Deposits (B2) _ Drift Deposits (B3)	indicator is suf	ficient) Surface Soil C Inundation Visi Sparsely Vege Hydrogen Sulfi	ble on Aerial Imagery tated Concave Surface de Odor (C1) ater Table (C2)		Secondary Indic  Water-stain  Drainage Parage of Salt Deposi  Stunted or Salt Geomorphic	ators (2 or more required) ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3) f Reduced Iron (C4) ts (C5) Stressed Plants (D1)
/DROLOGY /etland Hydrology Indicat rimary Indicators (any one _ Surface Water (A1) _ High Water Table (A2) _ Saturation (A3) _ Water Marks (B1) _ Sediment Deposits (B2) _ Drift Deposits (B3) _ Mat or Crust of Algae or	indicator is suf	ficient)  Surface Soil C Inundation Visi Sparsely Vege Hydrogen Sulfi	ble on Aerial Imagery tated Concave Surface de Odor (C1) ater Table (C2)		Secondary Indic  Water-stain  Drainage Pa Oxidized Rh  Presence of Salt Deposi  Stunted or S Geomorphic Shallow Aqu	ators (2 or more required) ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3) f Reduced Iron (C4) ts (C5) Stressed Plants (D1) the Position (D2) uitard (D3)
/DROLOGY /etland Hydrology Indicat rimary Indicators (any one _ Surface Water (A1) _ High Water Table (A2) _ Saturation (A3) _ Water Marks (B1) _ Sediment Deposits (B2) _ Drift Deposits (B3) _ Mat or Crust of Algae or	indicator is suf	ficient)  Surface Soil C Inundation Visi Sparsely Vege Hydrogen Sulfi	ble on Aerial Imagery tated Concave Surface de Odor (C1) ater Table (C2)		Secondary Indic  Water-stain  Drainage Pa Oxidized Rh  Presence of Salt Deposi  Stunted or S Geomorphic Shallow Aqu	ators (2 or more required) ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3) if Reduced Iron (C4) ts (C5) Stressed Plants (D1) to Position (D2) uitard (D3) aphic Relief (D4)
/DROLOGY //etland Hydrology Indicar rimary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or X_ Iron Deposits (B5)	indicator is suf	ficient)  Surface Soil C Inundation Visi Sparsely Vege Hydrogen Sulfi	ble on Aerial Imagery tated Concave Surface de Odor (C1) ater Table (C2)		Secondary Indic  Water-stain  Drainage Pa  Oxidized Rh  Presence o  Salt Deposi  Stunted or S  Geomorphic  Shallow Aqu  Microtopogr	ators (2 or more required) ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3) if Reduced Iron (C4) ts (C5) Stressed Plants (D1) to Position (D2) uitard (D3) aphic Relief (D4)
/DROLOGY //etland Hydrology Indicarrimary Indicators (any one _ Surface Water (A1) _ High Water Table (A2) _ Saturation (A3) _ Water Marks (B1) _ Sediment Deposits (B2) _ Drift Deposits (B3) _ Mat or Crust of Algae or (A) _ Iron Deposits (B5)  // eld Observations:	indicator is suff	ficient)  Surface Soil C Inundation Visi Sparsely Vege Hydrogen Sulfi	ble on Aerial Imagery tated Concave Surface de Odor (C1) ater Table (C2) n Remarks)		Secondary Indic  Water-stain  Drainage Pa  Oxidized Rh  Presence o  Salt Deposi  Stunted or S  Geomorphic  Shallow Aqu  Microtopogr	ators (2 or more required) ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3) if Reduced Iron (C4) ts (C5) Stressed Plants (D1) to Position (D2) uitard (D3) aphic Relief (D4)
/DROLOGY //etland Hydrology Indicat rimary Indicators (any one _ Surface Water (A1) _ High Water Table (A2) _ Saturation (A3) _ Water Marks (B1) _ Sediment Deposits (B2) _ Drift Deposits (B3) _ Mat or Crust of Algae or X Iron Deposits (B5)  //eld Observations: urface Water Present?	Marl (B4)	icient)  Surface Soil Communication Vision Sparsely Vege Hydrogen Sulfion Dry-Season W Other (Explain i	ble on Aerial Imagery tated Concave Surface de Odor (C1) ater Table (C2) n Remarks)		Secondary Indic  Water-stain  Drainage Pa  Oxidized Rh  Presence o  Salt Deposi  Stunted or S  Geomorphic  Shallow Aqu  Microtopogr	ators (2 or more required) ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3) if Reduced Iron (C4) ts (C5) Stressed Plants (D1) to Position (D2) uitard (D3) aphic Relief (D4)
YDROLOGY Vetland Hydrology Indicators (any one many Indicators (any one surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or X Iron Deposits (B5)  ield Observations: urface Water Present? Vater Table Present?	Marl (B4)  YesX YesX	icient)  Surface Soil Communication Vision Sparsely Vege Hydrogen Sulfion Dry-Season W Other (Explain i	ble on Aerial Imagery tated Concave Surface de Odor (C1) ater Table (C2) n Remarks)  (inches):0"	e (B8)	Secondary Indic  Water-stain  Drainage Pa Oxidized Rh  Presence o Salt Deposi Stunted or S Geomorphic Shallow Aqu Microtopogr FAC-Neutra	ators (2 or more required) ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3) f Reduced Iron (C4) ts (C5) Stressed Plants (D1) to Position (D2) uitard (D3) aphic Relief (D4)
YDROLOGY Vetland Hydrology Indicator (any one many Indicators (any one surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or X Iron Deposits (B5)  ield Observations: urface Water Present?	Marl (B4)  YesX YesX YesX	ficient)  Surface Soil C Inundation Visi Sparsely Vege Hydrogen Sulfi Dry-Season W Other (Explain i	ble on Aerial Imagery tated Concave Surface de Odor (C1) ater Table (C2) n Remarks)  (inches):0" h (inches):0"	(B8)	Secondary Indic  Water-stain  Drainage Pa Oxidized Rh  Presence of Salt Deposi  Stunted or S Geomorphic Shallow Aqu Microtopogr FAC-Neutra	ators (2 or more required) ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3) f Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) aphic Relief (D4) I Test (D5)
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Vetland Hydrology Indicar rimary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat or Crust of Algae or X Iron Deposits (B5)  ield Observations: urface Water Present? vater Table Present? aturation Present? includes capillary fringe) escribe Recorded Data (streams and surface water)	Marl (B4)  YesX YesX YesX	ficient)  Surface Soil C Inundation Visi Sparsely Vege Hydrogen Sulfi Dry-Season W Other (Explain i	ble on Aerial Imagery tated Concave Surface de Odor (C1) ater Table (C2) n Remarks)  (inches):0" h (inches):0"	(B8)	Secondary Indic  Water-stain  Drainage Pa Oxidized Rh  Presence of Salt Deposi  Stunted or S Geomorphic Shallow Aqu Microtopogr FAC-Neutra	ators (2 or more required) ed Leaves (B9) atterns (B10) nizospheres on Living Roots (C3) f Reduced Iron (C4) ts (C5) Stressed Plants (D1) c Position (D2) uitard (D3) aphic Relief (D4) I Test (D5)

Project/Site: Kodiak Airport / Coast Gua	urd Reservation / Buskin R. St	ate Recreat	tion Area	Borough/City: Koo	diak Island	Sampling Date: 9.13.07
Applicant/Owner: Alaska Department of					aran Totalia	Sampling Point: G-1
Investigator(s): M. Raad, T Johnson, R.				Landform (hillside	torrace h	nummocks, etc.):linear depress
Local relief (concave, convex, none): none					, terrace, r	iummocks, etc.):iinear depress
Subregion: Southcentral Alaska	Lat:	G 1986	Lo	ong:		Datum:
Are climatic / hydrologic conditions on the						
Are Vegetation, Soil, or F						
Are Vegetation, Soil, or F	lydrology naturally pr	oblematic?	(If r	needed, explain any	answers i	n Remarks.)
SUMMARY OF FINDINGS - At	tach site map showing	g samplir	ng point	locations, tran	sects. ii	mportant features, etc.
			O Internation	, , , , , , , , , , , , , , , , , , , ,		inportant routures, etc.
riyunc son Present? Yes X No wi			Is the Sampled Area			
			within a Wetland? Yes X No			
Wetland Hydrology Present? Yes X No No Remarks:						
Non-wetland areas are dominated by gr	ravel fill slone with moss. Dioc	a sitahansi	a and Cali			
The world are do minated by gr	aver illi slope with moss, Pice	a sitchensi	s, and Salix	spp.		
VEGETATION						
0 1 10		Absolute	Indicator			
Species (Use scientific names. List all s	species in plot.)	% Cover	Status	Prevalence Inde		
1. Agrostis capillaris		TR	FACU			Multiply by:
2. Aruncus dioicus		5%	UPL			x 1 = <u> 85</u>
Carex lenticularis var. lipocarpa      Deschampsis esserites.			OBL			x 2 = <u>30</u>
Deschampsia cespitosa     Equisetum hyemale		10%	OBL	FAC species		
6 Jungua alainua		15%	FACW	FACU species		
7 0-1: 11 1			OBL			x 5 =
8. Salix scouleriana			FAC			(A) <u>250</u> (B)
9		15%	FAC	Prevalence	Index = E	B/A = <u>1.72</u>
10						
11						ent a section of the
12						phytic Vegetation: Remarks or on a separate
13.				sheet.)	ig data iii	riomaiks of off a separate
14.				Wetland Cry	ptogams (r	ecord species and cover
15				at left)		
16				Morphologica	al Adaptation	ons
17	941			Problematic I	Hydrophyti	c Vegetation (Explain)
18						
19						
20						
	Total Cover:			Ultralina in b 41 -		
Plot size9-meter radius	% Bare Ground			Hydrophytic Vegetation		
% Cover of Wetland Bryophytes				Present? Yes X No		
Remarks:	Total Cover of Bryopi	iytes				
to the distance and \$7.50 kg.						

Complina	Daint	0 1	
Sampling	Point.	G-1	

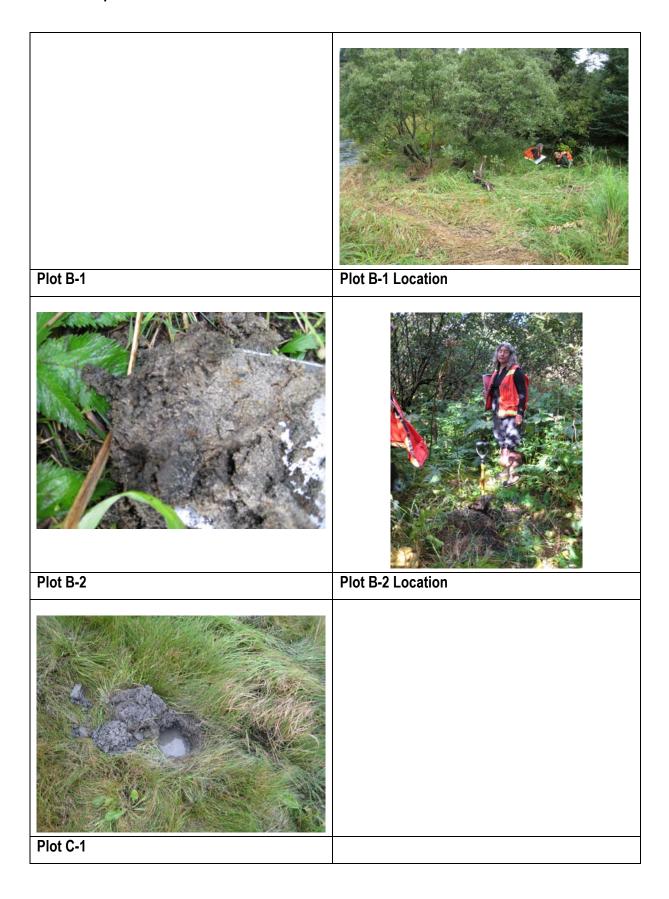
Profile Description: (Des								
Depth Ma (inches) Color (moi	st) %	Color (moist)	lox Features %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks	
				1,100				
0-5" 10 YR 2/2	100%	none				sandy clay loam co	arse gravels at 5"	
		-						
Type: C=Concentration, D	=Depletion, RN					RC=Root Channel, M=N	Matrix.	
lydric Soil Indicators:		Indicators for			Soils':			
Histosol or Histel (A1)		Alaska Co	1757			Alaska Gleyed Without Hue 5Y or Redder		
Histic Epipedon (A2)			oine Swales			Underlying L		
Hydrogen Sulfide (A4)	2)	Alaska He	dox With 2.5	or Hue		Other (Explain	in Hemarks)	
Thick Dark Surface (A1 Alaska Gleyed (A13)	2)	<sup>3</sup> One indicator	of hydronby	tic vegete	tion one	primary indicator of we	land hydrology	
Alaska Gleyed (A13) Alaska Redox (A14)			F 10 100	1000		st be present.	iand riydrology,	
Alaska Gleyed Pores (/	A15)	<sup>4</sup> Give details o		The state of the state of		or be present.		
Restrictive Layer (if prese				<b>j</b> o,				
Type:	,.							
Depth (inches):						Hydric Soil Presen	? Yes X No	
Remarks:						rijunio com ricouni	<u></u>	
YDROLOGY Vetland Hydrology Indica	tors:					Secondary Indicato	rs (2 or more required)	
rimary Indicators (any one	indicator is suf	fficient)				Water-stained	_eaves (B9)	
X Surface Water (A1)		Surface Soil Cr	acks (B6)			Drainage Patte	rns (B10)	
High Water Table (A2) Inundation Visible on Aerial Imagery (B7)		(B7)	Oxidized Rhizospheres on Living Roots (C3)					
Saturation (A3) Sparsely Vegetated Concave Surface (B8) Water Marks (B1) Hydrogen Sulfide Odor (C1)						e (B8)		
Sediment Deposits (B2		Dry-Season Wa		(2)			ssed Plants (D1)	
_ Drift Deposits (B3)	76 3 40 3	_ Other (Explain in	n Remarks)			Geomorphic Po		
_ Mat or Crust of Algae o	r Marl (B4)					Shallow Aquita		
Iron Deposits (B5)				Microtopographic Relief (D4) FAC-Neutral Test (D5)				
ield Observations:						FAC-Neutral 16	est (D5)	
Surface Water Present?	Ves X	_ No Depth	(inches).					
Vater Table Present?		_ No Deptil						
Saturation Present?		_ No Depti				and Hydrology Preser	t? Yes_X No	
includes capillary fringe)							105 <u>X</u> NU	
Describe Recorded Data (st	ream gauge, m	onitoring well, aerial	photos, pre	vious insp	ections),	if available:		
lemarks:								
lemarks:								
Remarks:								

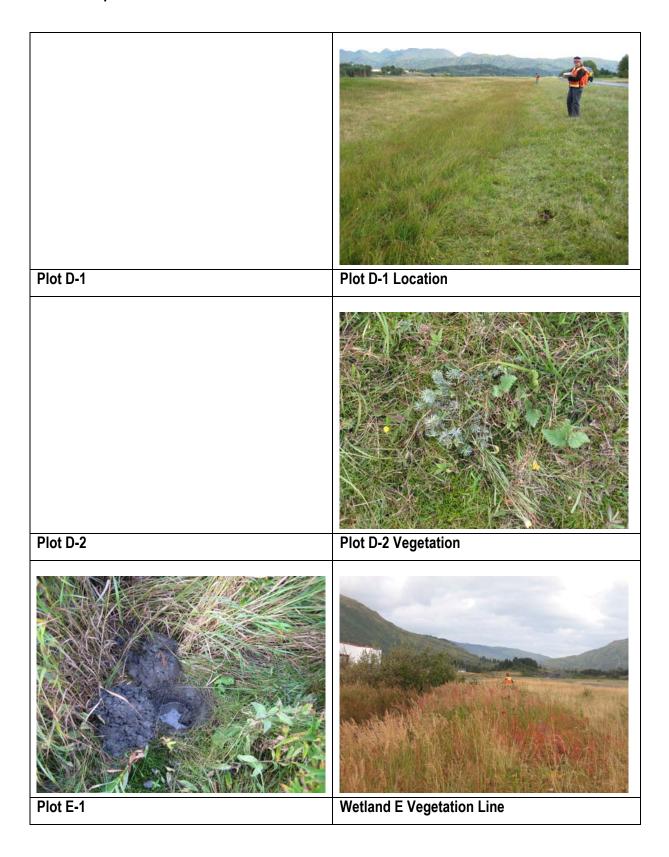
Kodiak Airport EIS – Wetland Delineation Report

Appendix D: Ground Level Color Photographs

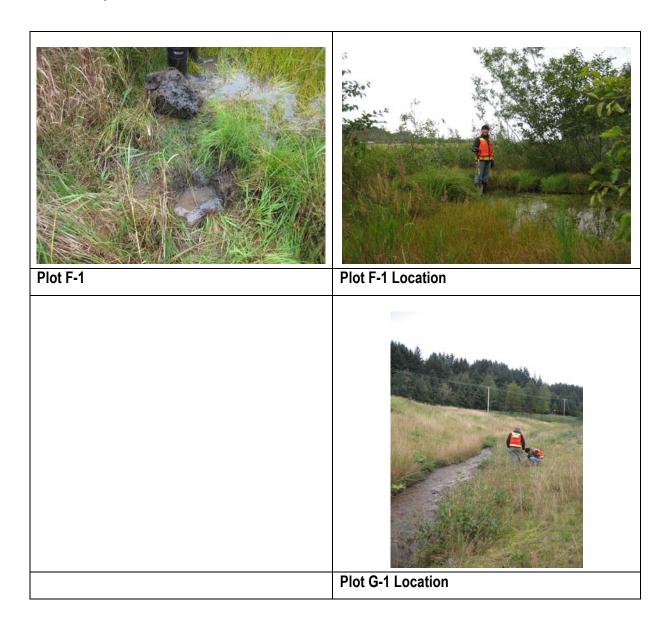






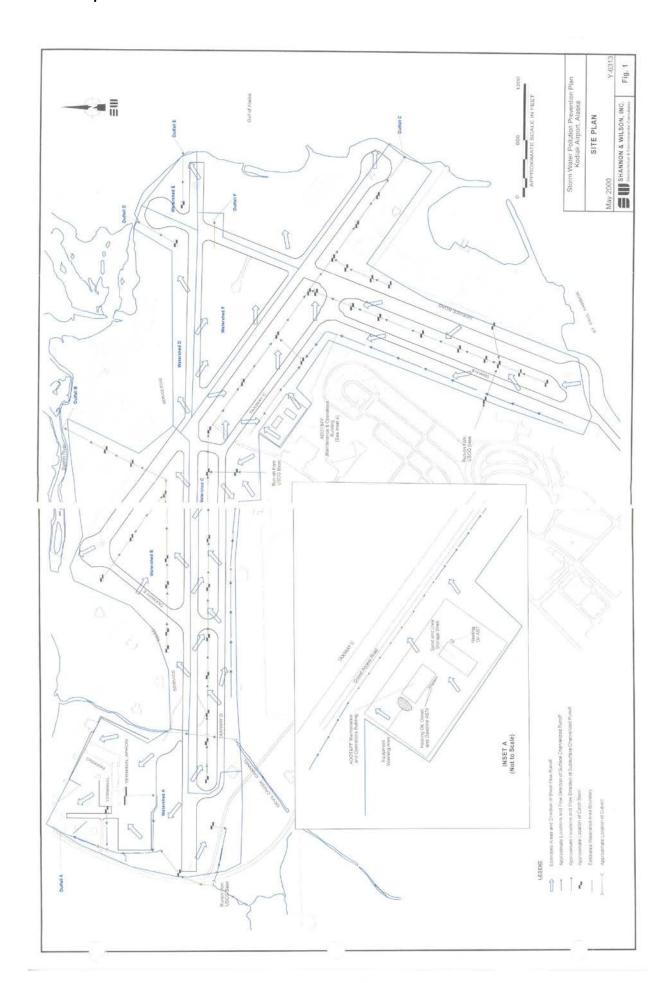


#### Kodiak Airport EIS – Wetland Delineation



Kodiak Airport EIS – Wetland Delineation Report

Appendix E: Stormwater Drainage System



Kodiak Airport EIS – Wetland Delineation Report

Appendix F: Functional Assessment

### 1 Wetland Functions

A wetland delineation report (May 2008) was prepared to support the Kodiak Airport Environmental Impact Statement (EIS), and the U.S. Army Corps of Engineers concurred with this delineation on August 4, 2008. Wetlands located at the Airport study area are illustrated in **Figure 1-1**. Wetland functions were assessed as part of the wetland delineation effort using a number of established hydrogeomorphic (HGM)-based methods. The selected methods include:

- Hydrogeomorphic (HGM) Assessment Guidebook for Tidal Wetlands of the Oregon Coast, Part 1: Rapid Assessment Method; <sup>1</sup>
- Wetland Functional Assessment Guidebook, Operational Draft Guidebook for Assessing the Functions for Riverine and Slope River Proximal Wetlands in Coastal Southeast and Southcentral Alaska Using the HGM Approach;<sup>2</sup> and
- Guidebook for Hydrogeomorphic (HGM)-based Assessment of Oregon Wetland and Riparian Sites. Volume 1A: Assessment Methods. <sup>3</sup>

Rationale for the application of these different HGM assessment methods is included within the description of each specific wetland.

The assessment methodologies were modified as necessary to better match the conditions at the Airport and to take full advantage of data being collected by the EIS consulting team for other resource-specific field investigations. The technical memoranda describing these efforts were used to support the wetland functional assessments as well as personal communication with specific project staff. References include:

- Freshwater and Marine Ecology Technical report for Kodiak Airport Environmental Impact statement, Kodiak, Alaska (in preparation);<sup>4</sup>
- Kodiak Airport EIS Water Resources Technical Memorandum;<sup>5</sup> and
- Spencer Martin, principal ecologist, SWCA.<sup>6</sup>

Functional assessment forms are included in **Appendix A** of this memorandum. All of the referenced methods use a similar numeric scoring system, but interpretation of the

<sup>&</sup>lt;sup>1</sup> Adamus, P.R., *Hydrogeomorphic (HGM) Assessment Guidebook for Tidal Wetlands of the Oregon Coast, Part 1: Rapid Assessment Method.* Report to Coos Watershed Association, US Environmental Protection Agency Region 10, and Oregon Department of State Lands, Charleston, Oregon, 2006.

<sup>&</sup>lt;sup>2</sup> Powell, J.E., D.V. D'Amore, R. Thompson, P. Huberth, B. Bigelow, M.T. Walter, and T. Brock. *Wetland Functional Assessment Guidebook, Operational Draft Guidebook for Assessing the Functions for Riverine and Slope River Proximal Wetlands in Coastal Southeast and South central Alaska Using the HGM Approach*. State of Alaska Department of Environmental Conservation. June 2003.

<sup>&</sup>lt;sup>3</sup> Adamus, P.R. and D. Fields. *Guidebook for Hydrogeomorphic (HGM)-based Assessment of Oregon Wetland and Riparian Sites. Volume 1A: Assessment Methods.* Oregon Division of State Lands, Salem, Oregon. 2001.

<sup>&</sup>lt;sup>4</sup> SWCA Environmental Consultants, Freshwater and Marine Ecology Technical report for Kodiak Airport Environmental Impact statement, Kodiak, Alaska (in preparation)

<sup>&</sup>lt;sup>5</sup> Vigil-Agrimis, Inc. Kodiak Airport EIS Water Resources Technical Memorandum, June 2008

<sup>&</sup>lt;sup>6</sup> Spencer Martin, principal ecologist, SWCA Environmental Consultants, Personal communication with Maureen Raad, Vigil-Agrimis, Inc. September 23, 2008

scores has been made more intuitive by cross-reference to a qualitative rating, as illustrated in **Table 1-1**. It is important to note that comparing the scores of wetlands in different HGM classes may not accurately portray the value of the provided functions.

TABLE 1-1 NUMERIC SCORE – QUALITATIVE RANKING EQUIVALENTS

Numeric Score Range	Qualitative Ranking
0 - 0.1	Low
0.2 - 0.3	Moderate-Low
0.4 - 0.5	Moderate
0.6 - 0.7	Moderate-High
0.8 - 0.9	High
1	Very High

### 1.1 Tidal Fringe Wetlands

Methods described in the HGM Assessment Guidebook for the Oregon Coast were used to assess the functions of tidally-influenced Wetland A because no tidal fringe wetland assessment methodology for an applicable Alaska-region was available. Data Forms A1, B1, and B2 were filled out as part of the functional assessment. Form C, which provides a valuation of the assessed functions, is organized into function categories similar to those in the other two methodologies used to assess wetland functions at the Airport and was therefore used to populate Table 1.1-1. Questions on the biological functions provided by the wetlands were answered using data collected for the EIS and described in *Freshwater and Marine Ecology Technical report for Kodiak Airport Environmental Impact statement, Kodiak, Alaska (in preparation)*<sup>7</sup> and in conversation with Spencer Martin of SWCAI.<sup>8</sup> These data included information gathered from NMFS, USFWS, ADNR, ADEC, ADFG, and the local Audubon Society as well as direct field observations.

Because the vegetation in this wetland was of a uniform plan community no transect vegetation data was collected. Vegetation data collected for the wetland delineation report was used to categorize the wetland vegetation.

Alaska regularly experiences earthquakes and is vulnerable to tsunami resulting from deep ocean quakes. In 1964 an earthquake generated tsunami ravaged the City of Kodiak as well as smaller coastal communities on the Island. For this reason, the *National Guidebook for the Application of Hydrogeomorphic Assessment to Tidal Fringe* 

<sup>&</sup>lt;sup>7</sup> SWCA Environmental Consultants, Freshwater and Marine Ecology Technical report for Kodiak Airport Environmental Impact statement, Kodiak, Alaska (in preparation)

<sup>&</sup>lt;sup>8</sup> Spencer Martin, principal ecologist, SWCA Environmental Consultants, Personal communication with Maureen Raad, Vigil-Agrimis, Inc. September 23, 2008

Wetlands<sup>9</sup> was reviewed so a judgmental assessment of tidal surge attenuation function could be included. The variables described in this document were quantified and used to generate a qualitative assessment of function in the absence of local reference wetlands.

Wetland A is one of the largest wetlands in the study area. As part of the Buskin River system it provides a source of food and refuge for a number of anadromous fish and other species. The functional ratings for the wetlands within the project area are provided in **Table 1.1-1.** 

TABLE 1.1-1 FUNCTIONS PROVIDED BY TIDAL FRINGE WETLANDS

Wetland ID	A
Size (acres)	9.6
Functions	Scores
Hydrologic Control	_
Tidal Surge Attenuation	ML
Water Quality	
Maintaining Element Cycling Rates & Pollutant Processing & Stabilizing Sediment	МН
Primary Production & Exporting Above Ground Production	Н
Habitat	1
Maintaining Habitat for Resident Fish & Visiting Marine Fish	МН
Maintaining Anadromous Fish	Н
Maintaining Invertebrate Habitat	ML
Maintaining Habitat for Ducks, Geese & Shorebirds	ML
Maintaining Habitat for Native Land Birds, Small Mammals, Their Predators, and Nekton-Feeding Birds	ML
Maintaining Natural Botanical Conditions	M

Note: VH = Very High, H = High, MH = Moderate-High, M = Moderate, ML = Moderate-Low, L=Low

A barrier bar separates the tidally influenced wetland from St. Paul Harbor. This barrier bar provides most of the tidal surge attenuation function by dissipating wave energy. The wetland does provide moderate-low tidal surge attenuation function because of the roughness of the vegetation and its ability to store some water during a storm surge or tsunami event.

Habitat support functions for salmonids and other fish were high to moderate-high with

<sup>&</sup>lt;sup>9</sup> Shafer, D.J and D. Yozzo. *National Guidebook for the Application of Hydrogeomorphic Assessment to Tidal Fringe Wetlands*. Technical Report WRP-DE-16. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Missouri, December 1998

lower scores for terrestrial mammals and birds. Brown bear primarily use the Buskin River upstream of the tidally influenced portion.

### 1.2 Riverine/Slope Proximal Wetlands

The riverine and slope river proximal assessment methodology was used because it was an appropriate regionally specific methodology for assessing the functions of the Buskin River and Wetland B<sup>10</sup>. As part of the EIS data collection, cross sections were established at 52 locations along the Buskin River. Field measurements and observations were made at each location and were recorded by a surveyor. In addition, sediment samples were taken at five locations and sent to a lab for a sieve analysis. This data was used in lieu of the cross section and pebble count data collection protocols described in the methodology. The 10-year and 100-year floodplains were also modeled using HEC-RAS, in part to inform our understanding of floodplain connectivity. The functional ratings for the wetlands within the project area and the Buskin River are provided in **Table 1.2-1**, based on the information included in the WetB.DataForm.

TABLE 1.2-1 FUNCTIONS PROVIDED BY RIVERINE/SLOPE PROXIMAL WETLANDS

Wetland ID	В	Buskin River
Size (acres)	0.15	19.4
Functions		Scores
Hydrologic Control		
Channel Meander Belt Integrity		MH
Dynamic Floodwater Retention		MH
Water Quality		
Nutrient Spiraling & Organic Carbon Export		MH
Particulate Retention		M
Removal of Imported Elements & Compounds		M
Habitat		
Maintenance of In-Channel Aquatic Biota		MH
Presence of Coarse Wood Structure		M
Maintenance of Riparian Vegetation		MH
Maintenance of Connectivity & Interspersion		MH

 $Note: \ VH = Very \ High, \ H = High, \ MH = Moderate-High, \ M = Moderate, \ ML = Moderate-Low, \ L = Low = Moderate + Moderate +$ 

<sup>&</sup>lt;sup>10</sup> Powell, J.E., D.V. D'Amore, R. Thompson, P. Huberth, B. Bigelow, M.T. Walter, and T. Brock. *Wetland Functional Assessment Guidebook, Operational Draft Guidebook for Assessing the Functions for Riverine and Slope River Proximal Wetlands in Coastal Southeast and South central Alaska Using the HGM Approach*. State of Alaska Department of Environmental Conservation. June 2003

Despite human alterations to the terraces adjacent to the Buskin River the floodplain and meander belt functions scored moderate-high, indicating that floodplain connectivity is still intact and the channel is not too incised.

Water quality functions were moderate to moderate-high. These functions are often lower for riverine wetlands that typically provide few opportunities for water to slow down and sediment to come out of suspension, thereby removing elements and compounds from the water.

The river supports several salmon runs so it is not surprising that this wetland scored moderately-high in the habitat category. The presence of coarse wood structure was only scored as moderate, reflecting a relative paucity of forest on Kodiak Island although forest cover is becoming more established as permafrost retreats.

## 1.3 Small Depressional and Riverine Wetlands

The judgmental method outlined in the Guidebook for HGM-based Assessment of Oregon Wetland and Riparian Sites was selected because it provided a quick evaluation method for the small degraded wetlands on the airport property. No modifications were made to this method. These wetlands do not support either resident or anadromous fish populations so these functions were not evaluated. The functional ratings for the wetlands within the project area are provided in **Table 1.3-1**, based on the information included in the applicable, attached dataforms.

The small size of these wetlands contributed to their relatively low function scores. The depressional wetlands -C, D, and F – had slightly higher scores for water storage and delay and sediment stabilization and phosphorus retention. Wetland F and G has more diverse vegetation with areas of standing water and so had slightly higher invertebrate and amphibian habitat support scores.

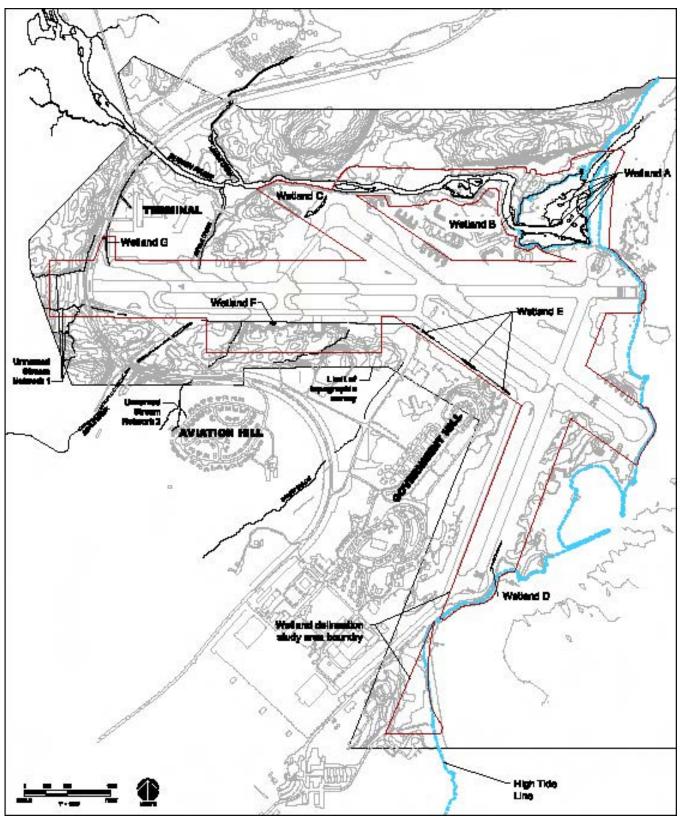
**TABLE 1.3-1** FUNCTIONS PROVIDED BY DEPRESSIONAL AND RIVERINE WETLANDS

Wetland ID	С	D	E	F	G
<b>HGM Classification</b>	D,O	D,O	R, FT	D,O	R, FT
Size (acres)	0.25	0.11	0.22	0.05	0.09
Functions			Scores		
Hydrologic Control					
Water Storage & Delay	M	M	ML	M	ML
Water Quality					
Sediment Stabilization & Phosphorous Retention	M	M	ML	M	ML
Nitrogen Removal	ML	ML	ML	M	ML
Primary Production	ML	ML	ML	ML	M
Thermoregulation	ML	ML	ML	ML	M
Habitat					
Resident Fish Habitat Support	1	-	-	ı	-
Anadromous Fish Habitat Support	1	-	-	1	-
Invertebrate Habitat Support	ML	ML	ML	M	M
Amphibian & Turtle Habitat	ML	ML	ML	M	ML
Breeding Waterbird Support	-	-	-	-	-
Wintering & Migratory Waterbird Support	-	-	-	-	-
Songbird Habitat Support	ML	ML	ML	ML	ML
Support of Characteristic Vegetation	ML	ML	ML	ML	ML

Note: VH = Very High, H = High, MH = Moderate-High, M = Moderate, ML = Moderate-Low, L=Low HGM Classification: D = Depressional, R = Riverine

Subclass: O = Outflow, FT = Flow-through

FIGURE 1-1
AIRPORT VICINITY WETLANDS AND OTHER WATERS



# APPENDIX A

Wetlan	Had A Date: 4/11/2002 7	egin:	ime Begin: Time End: Total Marsh Transect Length (combined):m	
Estima	Estimated Position of the assessed unit in the estuary: near ocean (lower one-third): $\sqrt{+}$ near in	aior head-of-tid	near maior head-of-tide (upper one-third):	
Estima		ń		
Mar	Marine-sourced High Marsh: 70 % Marine-sourced Low Marsh: 30 % R	River-sourced Tidal Wetland:	dal Wetland: 0 %	
code	indicator	scale/score	auidance	
1. BuffAlt	Relative buffer between the wetland and upland areas. Calculate: $A * (B + C)$ . [For example, for A, B, C below, calculate $2 \times (1 + 3) = 8$ .] Screen the resulting calculation with the scale on the right [ex: $8 = 0.3$ ], then enter the score in the box. Optionally, also enter an estimate of certainty (0 to 1).	0 = 0.01 $1.2 = 0.1$ $3.6 = 0.2$	Within 1000 ft = the percent within the entire area that is upland and within 100 ft. of the wetland-upland edge. Do not include the tidal wetland	
	A) Within 100 ft of the wetland's edge with adjoining upland, the % of the upland that contains pavement, buildings, or other bare substrate:	7-9 = 0.3 10-12 = 0.4 13-15 = 0.5	itself, but non-tidal wetlands may be included as part of that zone.	
		16-18 = 0.6	Measure the 100 ft horizontally from	
	76 uptand as described scale	19-21 = 0.7	the wetland's upper limit of annual	
	5-14 % 2	25-27 = 0.9	tidal modulig (inglicat tide).	
	15 – 24 % (3)	>27 = 1.0	Extend the 100 ft limit to 300 ft if a	
	25-49 %		perennial freshwater tributary flows	
	>>0 % 05<		through the wetland, i.e., 100 ft on	
	wetland occupies nearly all of an island, and 0		either side of the tributary channel, up	2000
	ווסודר טו נוור וסומות וס תהלבוסובת		to soo it away.	
	B) Within 100 ft of the wetland's edge, the predominant elevation of the portion of the upland that is most-disturbed (paved, landscaped, overgrazed, or bare):			
	S			
	20 it ingher than wetland (1)			
	>50 ft higher 3			
	C) Within 100 ft of the wetland's edge, the substrate predominating in the portion of the upland that is most-disturbed (paved, landscaped, overgrazed, or bare):			
	predominant substrate scale	score #1:		
	-	5		
	fine, sandy soil 2			
	coarse sand (minimal organin layer), fill, pavement, or rock 3	certainty #1:	* 4 4 4	
	Screen the resulting calculation with the scale on the right, then in the box enter the score and optionally an estimate of certainty (0 to 1)		used for: KA.*  * see page 23 or Appendix A for abbreviations	
	of the control of the		0.0141444444	

Hydrogeomorphic Assessment Guidebook for Tidal Wellands of the Oregon Coast, Part 1 – August 2006 Appendix A. Data Form A1

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AZ. Not completed, wetland has no internal channels

	Indicator	מרסומו	
2. Chemin	Maximum risk of the wetland being exposed to <b>chemical pollutants</b> (excluding <b>nutrients</b> ). Calculate: $T * (L + E)$ . [For example, $0 \times (1 + 1) = 0$ ] where:	ding 0 = 0.01 2 = 0.33 3 = 0.66	Toxicity = pollutants include substances potentially harmful to plants or animals and present well above any natural background level.
	T Toxicity scale	4 = 1.00	Load = runoff load of contaminants will depend partly on size,
	no pollutant sources likely in nearby runoff, 0 groundwater, or surface water; no history of recent spills reaching the wetland		slope, and soil type of the contributing area; consider annual maximum for a normal year.
	some pollutants (1)		Extent = "limited" would apply if surface water travels only in a single internal channel or if the only contaminant source is
	L Maximum Load (of contaminants) scale		at a localized spot along the upland edge.
	diffuse (distant source), or infrequent 1		"Certainty" should normally be scored very low for this
	concentrated (nearby source) or frequent (2)	score #2:	indicator. If measured data are available, you may use it to inform components (T) and (L).
	E Maximum Extent (of contaminants)	0.166	
	limited (only a small % of the wetland is likely to be exposed to the chemical)		
	most of wetland could be exposed 2	certainty #2:	
	Compare the result with the scale at the right to determine the score.		Used for: RA, Inv, Afish, Mfish, Rfish, [NFW, Sbird, LbirdM].
3. Nutrin	Maximum risk of <b>nutrient overload</b> in the wetland. Calculate: $S*(L+E)$ For example, $1 \times (1+2) = 3$ where:	0 = 0.01 2 = 0.33	Minor source type = widely-scattered houses, lawns, low-density grazing, parking lots, extensive stands of alder, recently humed or logged areas, and/or occasional large host
	S Source Type	3=0.66	traffic.
	no abnormal sources (0)	4=1.00	Major source type = neighborhoods (not on sewer lines),
	minor potential or known source of nitrogen or phosphorus		extensive concentrated grazing, waste treatment plant effluent, many malfunctioning septic systems, and/or boatyards,
	major potential or known source of nitrogen or phosphorus		harbors.
	L Maximum Load (of nutrients)	5 1	Loud, Lateric, See above.
	diffuse or diluted (distant source), or infrequent (1)		If measured data are available, you may use it to inform
	concentrated (nearby source) or frequent 2	score#3:	components (S) and (E).
	E Maximum Extent	0.0	
	only a small % of the wetland is likely to receive inputs due to its relative elevation & other factors		
	not localized 2	certainty #3:	2
	Compare the result with the scale at the right to determine the score.		Used for: RA, AProd, Dux, [WQ, Xpt, Inv, Afish, Mfish, Rfish, NFW, Sbird, LbirdM].

Hydrogeomorphic Assessment Guidebook for Tidal Wetlands of the Oregon Coast, Part 1—August 2006 Appendix A. Data Form A1

As a result of human activities outside the wetland, sediment loads reaching the wetland are currently (select one):    SedShed	Incoming fine-sediment overload.  As a result of human activities outside the wetland, sediment loads reaching the wetland are currently (select one):  sediment loads score mostly normal for the wetland's subclass and location in the estuary somewhat above normal for the wetland's subclass and location in the estuary, due to accelerated erosion unslone, unriver or aloneshore	ads reaching the	
	al for the wetland's subclass and location in the estuary ormal for the wetland's subclass tuary, due to accelerated erosion unslone, unriver or alonoshore.		loads.
	al for the wetland's subclass and location in the estuary ormal for the wetland's subclass tuary, due to accelerated erosion unslone, unriver or alonoshore.	SCOLE	Dotantial common includes and inchange lands and
	ormal for the wetland's subclass tuary, due to accelerated erosion unslone, unriver or alonoshore	(0.01)	areas, mining (especially gravel, placer), roads, frequent
		0.50	slope, substrate type, and number of years to recover.
	much above normal for the wetland's subclass and location in the estuary, due to accelerated erosion upslope, upriver, or alongshore	1.00	greater load than for a wetland near head-of-tide, because load increases downstream even in pristine estuaries.
		certainty #4:	Used for: RA, Inv, [Afish, Mfish, Rfish, NFW, Sbird, LbirdM].
ongoing historical but still apparent Select one number from each ro	How much of the assessment unit (only the part that is still wetland) has been affected by ongoing or past erosion/ compaction caused directly by human	u e	Potential disturbances within the wetland include: livestock, ATVs, restoration activities, subsidence associated with diking, ditches, fills, log storage. Consider
ongoing historical but still apparent Select one number from each ro		2 = 0.2 3 = 0.3	extent and severity.
historical but still apparent  Select one number from each ro	none 1-10% 10-50%	>50% 4 = 0.4	Infer past log storage from historical aerial photographs.
historical but still apparent Select one number from each ro	0 2 3	5=0.6	local contacts presence nearby of old nilings and
Select one number from each ro	0 1 (2)	3 6 = 0.8	partially-buried cut logs. Infer livestock from presence of
	row. Then sum the two chosen no	7 = 1.0	fences, or local knowledge.
the scale on the right to derive the score.	the score.		
		score #5:	
		0.7	
			1 [
			Used for: RA, AProd, WQ, [Xpt, Inv, Afish, Mfish, Rfish, NFW. Shird. LhirdM1.

eels) e ions.  score #6: 0.01  ling) as a artificial score #7: 0.01  certainty #6:	code	indicator	Score	quidance
no such alterations, and no changes observed (0.0)  flooding from tide or runoff occus less often as a cast of changes observed (0.0)  flooding from tide or runoff occus less often as a cast result of the alterations—nonetheless, nearly all areas a vittin the vedland that previously were flooded by daily lides or upland runoff in longer flood daily, but a sent areas that previously were flooded by daily lides, tides or upland runoff in longer flood daily, but a sent lided let let less water in the welland than previously be under so much less water in the welland than previously of daily tided it creutation has been eliminated from and all but a small part of the wetland; severe reduction in frequency, duration, and depth of daily and monthly high/low tide monthly ingh/low tide monthly ingh/low tide monthly ingh/low tide first lided are associated with these.  Note: For many diked wetlands, the appropriate score will be 0.66.  Degree this wetland and/or its channels becomes wetter (more ponding) as a result of installation of dikes, idegates, culverts, ditches, and other artificial constrictions or excavations, including substrate compaction and subsidence associated with these.  Score #7:    Degree this wetland and/or during heavy precipitation and subsidence often, longer, or more extensively as a result of alterations but only at monthly high (spring) tide and a monthly high (spring) tide and the nonger, or more extensively and this is noticeable each day; and/or upland at various much of the site remains flooded long after faily in the treatment subsidence following king high tide; and/or major increase in flooding as a result of the alterations much of the site remains flooded long after faily high tide; and/or major increase in flooding as a result of editine subsidence following divided and or major increase in flooding as a result of editine subsidence following and result of the site remains flooded flood and the subsidence following the subsidence following and subsidence following and result of the s	6. DikeDry	Degree the area that is still wetland (and including its internal channels) becomes <b>drier</b> (i.e., muted tidal flooding) as a result of ditches or the installation of dikes, tidegates, culverts, and other artificial constrictions.		Where historical data are lacking, consider "drier" relative to nearby unaltered wetlands of about the same elevation & size. Wetlands receiving little upland runoff
Thoo such alterations, and no changes observed   0.01		9,000		or groundwater seepage are especially vulnerable to this
The state of the		-		condition when they are thised. Mainly include
some areas that previously were flooded by daily 0.66 tides or upland runoff no longer flood daily, but are still tidal wetland; during monthly low tides, there is much less water in the wetland than daily tidal circulation has been eliminated from all but a small part of the wetland; severe reduction in frequency, duration, and depth of daily and monthly high/low tide  Note: For many diked wetlands, the appropriate score will be 0.66.  Degree this wetland and/or its channels becomes wetter (more ponding) as a result of installation of dikes, tidegates, culverts, ditches, and other artificial constructions or excavations, including substrate compaction and subsidence associated with these.  no such alterations, and no changes observed (0.0) some areas within the wetland now flood more often, longer, or more extensively as a result of alterations, but only at monthly high (spring) tide often, longer, or more extensively and this is noticeable each day; and/or upland runoff is noticeable each day; and/or upland runoff is noticeably impounded within the wetland at various much of the site remains flooded long after daily 1.00 high tide; and/or major increase in flooding as a result of sediment subsidence following diking Noter For mony diked by a contract of the alterations much of the site remains flooded long after daily 1.00 high tide; and/or major increase in flooding as a result of sediment subsidence following diking				the wetland. In rare instances decreased onsite flooding may be attributed to presence of upriver dams, water diversions, or dredging (deepening) of estuary mouths.
daily tidal circulation has been climinated from  all but a small part of the wetland; severe reduction in frequency, duration, and depth of daily and monthly high/low tide  Note: For many diked wetlands, the appropriate score will be 0.66.  Degree this wetland and/or its channels becomes wetter (more ponding) as a result of installation of dikes, tidegates, culverts, ditches, and other artificial constrictions or excavations, including substrate compaction and subsidence associated with these.  no such alterations, and no changes observed (0.01) some areas within the wetland now flood more (0.01) some areas within the wetland now flood more often, longer, or more extensively as a result of alterations, but only at monthly high (spring) tide and/or during heavy precipitation some areas within the wetland at various noticeable each day; and/or upland runoff is noticeably impounded within the wetland at various immed of the site remains flooded long after daily high tide; and/or major increase in flooding as a result of sediment subsidence following diking			score #6:	related increases in elevation of marsh surface, but include drying if due to sediment blockage of surface water inputs. As time allows, use procedures described by Brophy (2005) for locating tidegates.
Note: For many diked wetlands, the appropriate score will be 0.66.  Note: For many diked wetlands, the appropriate score will be 0.66.  Degree this wetland and/or its channels becomes wetter (more ponding) as a result of installation of dikes, tidegates, culverts, ditches, and other artificial constrictions or excavations, including substrate compaction and subsidence associated with these.  In o such alterations, and no changes observed 0.01  Some areas within the wetland now flood more 0.33  Often, longer, or more extensively as a result of alterations, but only at monthly high (spring) tide and/or during heavy precipitation of often, longer, or more extensively and this is noticeable each day; and/or upland runoff is noticeably impounded within the wetland at various flooded long after daily insert the set a result of the alterations much of the site remains flooded long after daily ingh floe; and/or major increase in flooding as a result of sediment subsidence following diking high floe; and/or major increase in flooding as a result of sediment subsidence following diking			10.0	
Note: For many diked wetlands, the appropriate score will be 0.66.  Degree this wetland and/or its channels becomes wetter (more ponding) as a result of installation of dikes, tidegates, culverts, ditches, and other artificial constrictions or excavations, including substrate compaction and subsidence associated with these.  In o such alterations, and no changes observed (0.01) some areas within the wetland now flood more often, longer, or more extensively as a result of alterations, but only at monthly high (spring) tide and/or during heavy precipitation some areas within the wetland now flood more often, longer, or more extensively and this is noticeably impounded within the wetland at various times as a result of the alterations much of the site remains flooded long after daily into high tide; and/or major increase in flooding as a result of sediment subsidence following diking result of sediment subsidence following diking result of sediment subsidence following diking		in frequency, duration, and depth of daily and monthly high/low tide	certainty #6:	
Degree this wetland and/or its channels becomes wetter (more ponding) as a result of installation of dikes, tidegates, culverts, ditches, and other artificial constrictions or excavations, including substrate compaction and subsidence associated with these.  In o such alterations, and no changes observed 0.01  Some areas within the wetland now flood more often, longer, or more extensively as a result of alterations, but only at monthly high (spring) lide and/or during heavy precipitation some areas within the wetland now flood more often, longer, or more extensively and this is noticeable each day; and/or upland runoff is noticeably impounded within the wetland at various times as a result of the alterations much of the site remains flooded long after daily high tide; and/or major increase in flooding as a result of sediment subsidence following diking result of sediment subsidence following diking treatments.		Note: For many diked wetlands, the appropriate score will be 0.66.		Used for: RA.
score #7: 0.0 (	7. DikeWet			Do not include dike breaching or removal that made the site wetter (such as that evidenced by dead trees).  Where historical data are lacking, consider "wetter" relative to nearby unaltered wetlands of about the same elevation. Diked wetlands are especially vulnerable to
score #7: 0.0 (				this condition if they have perennial tributaries, direct
score #7: 0.0 (		$\vee$		stormwater inputs, or seeps/wetlands along their upland
score #7: 0.0   certainty #7:				edge. In rare instances increased onsite flooding may be attributed to increased runoff from pavement, inputs from offsite ditches, or recent clearcuting in the watershed. As time allows, use procedures described by
Score #7:  0.0 ( certainty #7:			n in	Brophy (2005) for locating tidegates.
certainty #7:		noticeably impounded within the wetland at various times as a result of the alterations	score #7:	
			certainty #7:	
		Note: For many diked wetlands, the appropriate score will be 0.66.		Used for: RA.

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code	indicator						score	guidance
8. FootVis	Extent and frequency of wetland visitation. Calculate: $A + (B*2) + (C*3)$ . [For example, $10 + (20x2) + (70x3) = 260$ ] where:	frequency of wetla A + (B*2) + (C*3).	ind visitation.  [For example = 2000]	e, 10+	(20x2) +	-(70x3) = 260		A, B, and C must sum to 100%.  Assume an average visitor "casts a disturbance
	%(	nd & upland	1* visited only r	arely (<	10 days /	(1)		shadow" of radius 100 ft.
	by people on foot  BO (B) % of wetland & upland* with intermediate visitation frequency  LO (C) % of wetland & upland* visited daily or almost so (>360 days/yr)	on foot nd & upland nd & upland	* with intermed  * visited daily o	liate visit or almost	ation frec so (>360	luency days/yr)		Infer greater visitation frequency if closer to roads & buildings (especially population centers) milding and mostly high march and/or
	* includes	* includes upland within 100 ft.	iin 100 ft.				score #8:	signs of use, e.g., foot trails.
		+	the resulting number		score		00.	
	<110 (infr	requent & 1	<110 (infrequent & localized visitation)	tion)	0.01			
			110	140-199	0.53		certainty #8:	
	200+ (fr	equent & e	200+ (frequent & extensive visitation)	tion)	1.00			
								Used for: RA, NFW, Dux, Sbird.
9. Boate	How frequent and close is boat traffic (all types)?	close is bog	at traffic (all t	ypes)?			=	
		<100 ft away	100-1000 ft away	>1000 ft	# >		score #9:	
	seldom (<2x/day)	9.0	0.4	0.01			5	
	frequent	8.0	9.0	0.2				
	nearly constant	1.0	8.0	0.4				
	Select the largest number that is applicable and enter it in the Score box.	umber that	is applicable a	and enter	r it in tho	Score box.	certainty #9:	
								Used for: RA, NFW.
10. HomeDis	Proximity (ft) to the nearest inhab	e nearest i	nhabited structure.	cture.				Estimate the distance from the wetland-upland
12	proximity	ity score					score #10:	mist be:
	<200,	00, 1.00					000	(a) inhabited for at least 2 months per year, and
	200,-999,	9, 0.75					0	(b) not continuously separated from wetland by
	1000,-1999,	-	>					water wider than 10 ft., e.g., not on an opposite
	2000'-5000'						certainty #10:	shore. Aerial photographs or topo maps are
	>2000	0.01						useful.
								Used for: RA, LbirdM.

code	indicator					score	guidance
11. RoadX	Proximity (ft) to the nearest paved	e nearest p	oaved area				Consider parking lots (>20 vehicle capacity) to be primary roads. Primary roads usually have >1 vehicles/minute during
		<10 ft	10-100,	100-1000'		score #11:	the daytime. If a primary road horders only a finy fraction of
	primary roads	1.0	9.0	0.2		0	a wetland's upland edge, treat it as a secondary road
	secondary roads	9.0	(0.3)	0.01		o O	
	Enter the maximum appropriate number directly into the score box to the right.	л арргоргія	ate number	directly into the	score	certainty #11:	
							Used for: RA, LbirdM.
12. Invas	Presence or potential for invasive exotic invertebrates.	al for inva	sive exotic	invertebrates.		nen Tarata	Green crabs or other invasive invertebrate species have been documented in Tillamook. Netarts. Salmon. Siletz. Yaquina
					score		Alsea. Umngua. Coos and Cognille estuaries. Ovster
	no in reported	ivasive ext	otic invertel estuary (sec	no invasive exotic invertebrates have been reported from this estuary (see guidance at far	0.01		facilities are present in some of these plus in the Nehalem and Siuslaw estuaries.
	righ	nt), and the	ere are no o	right), and there are no oyster cultivation			
	Iacillues	or targe-	snip trajjic parts of t	racinnes or targe-snip traffic routes in similar parts of the same estuary		score #12:	Large ship traffic = deep-draft vessels, especially those that discharge foreign ballast water.
	ni on	wasive exc	otic invertel	no invasive exotic invertebrates have been	0.50		
	reporte	d from thi	s estuary (s	reported from this estuary (see column at far			(NO DATE)
	rigini, ou	nd/or largo	e ships trafi	and/or large ships traffic in the estuary			
	population	ns of invas	sive exotic	populations of invasive exotic invertebrates are	1.00	certainty #12:	
	knov	wn to have	s pecome es	known to have become established in this			Used for: RA, Inv, [Afish, Mfish, Rfish, NFW, Sbird,
				estuary			LbirdM].

code indicator	scale/score	guidance
13. Possible instability of the wetland.		
	3 = 0.01	
Calculate the following using the numeric values below:	101	
	1.0	
A + B + C + D + E = scale	5 = 0.2	
Then we the cond of the wints and auton a the hand		
Then use the search to the right and enter a scote in the pox.	0 = 0.3	
	7=04	
ANT :- 1 1 10 0 11 10 0 11		
A) LIVING trees of surubs > 10 ft. tall and flooded by tide at least once	8 = 0.5	
per vear:	90=0	
neign.		
Agricultural value	10 = 0.7	
many 1	11=08	
	0.0	
Iew 2	12 = 0.9	
none (3)	>12=10	
The state of the s		
B) Percent of wetland that is high marsh (not flooded daily during		
most of the month but still flooded occasionally by tide).	***	
The state of the s		
description value		
0 %05<	×	Control of the Control
1		Margh Leman to be here
10-50%		
		to land to the transame.
1-10%		
/10/		
C) Change in area of wetland and adjoining tideflat as indicated from		(C) Do not include direct losses from filling or diling
Little and the second and the second as marked non		(c) Do not motine unect rosses from mining of untillig,
1		of increases due to restoration — include only those
description value		from sedimentation or erosion. If area loss can be
increase from sedimentation.		documented at any time since 1850 assign a "0"
	Well and the second sec	
or no noticeable change, or no data		regardless of possible subsequent increased area. Be
loss of marsh area from erosion or windblown sand		
		carotal whon comparing institutal maps of acida
(not from ming, arking, dramage)		photographs, as apparent changes may actually be due
		to differences in the daily or monthly tidal cycle when
D) Tidal circulation.		the imega tree recorded
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		The titude of the technique.
no evidence tidal flooding restricted during past 100 years 0		(D) Restoration may have been intentional or from
full daily tidal flooding resumed more than 10 years ago		notival andion of dilon Doction tidal flooding
1		natural crosion of dires. Fardal mai mooding
full daily tidal flooding resumed less than 10 years ago		includes marshes with "muted" tidal amplitude due to
nortial tidal flooding recumed move than 10 years and 2	Score #13:	Transfer perturbions or modified tidesector Descent
		cuivent testiletions of inounied inegates. Fleschee of
partial tidal flooding resumed less than 10 years ago		dike remnants does not always mean tidal flooding is
	0.00	nartial
E) Predominant substrate.		a see
description value		
loam silt clav	certainty #13:	
1		
sandy soil (2)		
sand dines fill dredoed material rock 3		Used for RA WO

NEGRAN Table 6 Farm 0.02 Minor 0.005 Table 7 Tall Grass 0.035 n = 0.06

Vdist 110.5 ft AVE = 620 ft.

TSA = 620 + 0.06 /2 = 310.03

Compaired to the Russim and American River estration this is quite

the wave every. The mother is also beind a barrier bour that will absorp much of

code	indicator						scale	scale/score	guidance
	Imagine the wetland under each tidal condition listed below.	under each	n tidal co	ndition lis	sted belov	۷.			Assume conditions are averaged over February—June.
Flood							0	= 0.01	If the site cannot be visited repeatedly, answer this based
	What % of the wetland's area (including its internal tidal channels)	nd's area (i	including	; its intern	al tidal cl	nannels)	1	= 0.1	on visual estimation of the topography of the wetland
	is likely to be accessible to young anadromous fish?	ible to you	ing anad	romous f	ish?		2	= 0.2	relative to the tidal amplitude reported from the closest
							3-4	= 0.3	monitoring station in the estuary (see <b>Tidal range in</b>
	As your answer, select one number from each row, then sum the	ct one nun	nor fron	n each row	7, then su	m the	9-5	= 0.4	Oregon estuaries, below) or improved local data (where
	four numbers and use their sum with the scale on the right to	e their sum	with the	scale on	the right	to	7-8	= 0.5	available).
	generate a score for the box.	the box.					9-10	9.0=	
							11-12	= 0.7	Salmonid distribution mans are available on the internet
	//	%0	1		-09		13-14	= 0.8	at:
	during:	(none)	1-10%	10-20%	%06	%06<	15-16	60=	rainhow offer state or us/nrimm/information/fish distmans
	Monthly low tide	0	9	S	9	7	×1×	= 1.0	htm
	Daily low tide	0	3	4	5	9	2	2.	IIIIII
	Daily high tide	0	2	3	4	5			
	Monthly high tide	0	1	2	(3)	4	score #25:	:5:	
							0	0	
							certainty #25:	/#25:	
									Used for: Xpt, Afish, Mfish, Rfish, Dux, LbirdM, [NFW].

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# Tidal range in Oregon estuaries (mostly from Hamilton 1984). Use better local data when available.

		daily	monthly			daily	monthly			daily	monthly
estuary	location	range (ft.)	range (ft.)	estuary	location	range (ft.)	range (ft.)	estuary	location	range (ft.)	range
Necanicum	Seaside	4.7	5.8	Siletz	Taft	5.0	6.1	Umpqua	Winchester	5.1	6.9
Nehalem	Brighton	5.9	7.8		Kernville	4.6	9.9	ć	Reedsport	5.1	6.7
	Wheeler	5.9	7.6	Yaquina	So. Beach	6.3	8,3	Coos	mouth	5.2	7.0
	Nehalem	9.6	7.2		Yaquina	6.2	8.2		Charleston	5.7	7.5
Tillamook	Barview	6.2	8.2	Alsea	Waldport	5.8	7.7		Empire	4.9	6.7
	Garibaldi	5.9	7.8		Drift Cr.	5.0	6.2		Coos Bay	5.6	7.3
	Bay City	5.4	7.1	Siuslaw	mouth	5.5	7.3	Coquille	Bandon	5.2	7.0
	Tillamook	5.2	9.9		Florence	5.4	7.3	Rogne	Wedderburn	4.9	6.7
Netarts	Whiskey Cr.	4.8	7.8		Cushman	5.5	7.3	Chetco	Brookings	5.1	7.0
Sand Lake	1	5.7			Tiernan	5.9	7.7				
Nestucca	mouth	5.8	7.6		Mapleton	6.2	8.0				

Kodiak gage data - Women's Bany daily range 6.76 Ft

Maryen Harring

MHHW 9.53 MHW 8.63 MLW 1.87 MLW 0.76

	code	indicator	Score	auidance
Skip if no low marsh is present.	26. Shade	Percent of the entire wetland's vegetated area that is <b>shaded</b> by trees or topography:		To count, it must be shaded for 4+ hours during an average cloudless day.
[Skip if no low marsh is present.]  Percent of <i>only</i> the low marsh that is <b>shaded</b> by trees or topography:    1-10%			score #26: 0 · 0\ certainty #26:	Include parts of the <i>internal channel</i> network that are inundated most days and are shaded by deep incision, logs, or undercut banks. <i>Internal channels</i> include both tributary channels (flowing from uplands) and blind channels (flooding with the incoming tide).
Skip if no low marsh is present.   Skip if no low marsh that is shaded by trees or topography:    Note				Used for: AProd, [WQ, Xpt, Inv, Afish, Mfish, Rfish, NFW, Sbird, LbirdM].
topography:    1-10%   0.01	27. ShadeLM	[Skip if no low marsh is present.] Percent of <i>only</i> the low marsh that is <b>shaded</b> by trees or	score #27:	See above.
Area of <b>bare substrate</b> , including <i>pannes</i> , shallow pools, and tideflats wider than 2m and located <i>within</i> the wetland:    Area of <b>bare substrate</b> , including <i>pannes</i> , shallow pools, and tideflats wider than 2m and located <i>within</i> the wetland:    O-4 sq. m   O.01		topography:	0 . 0 l	As a reminder, "low marsh" is defined as areas flooded by the tide during the majority of days during most months of the year. Low marsh is not limited just to areas that flood every day.
Area of <b>bare substrate</b> , including <i>pannes</i> , shallow pools, and tideflats wider than 2m and located <i>within</i> the wetland:    A-100 sq.m   0.050     2,500-10,000 sq.m   0.75     2,500-10,000 sq.m   1.00		-		Used for: Afish.
m 0.01 .m 0.25 .m 0.50 .m 0.75 .m 1.00	28. Bare	Area of <b>bare substrate</b> , including <i>pannes</i> , shallow pools, and tideflats wider than 2m and located <i>within</i> the wetland:	score #28:	Pannes = shallow mostly-bare depressions in the marsh surface and aren't currently a part of tidal channels.
.m 0.25 .m 0.50 .m 0.75 .m 1.00		ea m	0,50	Assess continuon as at jow fide.
.m 0.75			certainty #28:	
.m 1.00		1 1		Used for: AProd, NFW, Dux, Sbird, IWO, Xpt. Inv.
		H.		Afish, Mfish, Rfish, NFW, Sbird, LbirdMJ.

code	indicator	score	quidance
29. Pannes	d p	score #29:	Isolated = lacking a surface connection to other waters during daily low tide
	0-4 sq. m 0.01 4-100 sq.m 0.25	09'0	
	2,500-10,000 sq.m 0.75 >10,000 sq.m 1.00	certainty #29:	Used for: Inv, Rfish, [Affsh, Mfish, Sbird, LbirdM].
30.	Transition angle along most of the wetland external edge:		External edge = the edge between the marsh and
	gradual, or steep but stable 0.01 view with extensive erosion and undergutting 1.00	Score#30:	adjoining bay or tidal river.
	_	certainty #30:	
			Used for: WQ.
31. UpEdge	ime or t	score #31:	Perimeter = the wetland's edge with upland plus with unvegetated water or tideflat. Do not include internal channels in the calculation of the marsh perimeter. If possible, use computer GIS software to measure the perimeter and edges.
	1-25 0.25 25-50 0.50 50-75 0.75 >75 1.00	certainty #31:	Used for: WQ, LbirdM.

code	Indicator	score	quidance
32. LWDchan	Number of pieces of large woody debris (LWD) in wetland's tidal channel network:  # LWD in channel score  0, or no channels present 0.01  1-10 0.50	score #32: 0 .0 [	To count, the LWD must have a diameter >15 cm and a length >2m.
	-		Used for: Inv, Afish, [Rfish, Mfish, Sbird, LbirdM].
33. LWDmarsh	E .	score #33:	
	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	certainty #33:	Used for: LbirdM.
34. LWDline	Driftwood line as % of wetland's upland edge length:    % score   0 0.01   1-9 0.25	score #34:	Driftwood line = LWD arranged naturally in a linear pattern, usually parallel to upland, as a result of tides. (Driftwood lines are often close to the elevation of annual high tide)
		certainty #34:	Used for: Inv, LbirdM, [Afish, Mfish, Rfish, NFW, Sbird.]

code	indicator	scale/score	guidance
35. TribL	Cumulative length (in miles) of fish-accessible non-tidal tributary channels that feed into the wetland:    length   score	score #35:	Measure only the tributary channels that pass through the wetland. Don't count the adjoining main river channel. Estimate length beginning at the wetland's upland margin and extending to the upstream limit of fish-accessible waters. ODFW has information on salmonid use areas: rainbow.dfw.state.or.us/nrimp/information/fishdistmaps.htm Used for: Xpt, Inv, Afish, NFW, Dux, LbirdM, [Mfish, Rfish, Sbird].
Presh	Types of freshwater sources that feed the wetland internally.  Select the maximum score in each group and then sum the two maxima:  Group A: Flowing into the wetland score intermittent fresh tributary or stormwater pipe 2 intermittent fresh tributary or stormwater pipe 2  Group B: Adjoining on the uphill side score large* non-tidal freshwater wetland, pond, or spring 4 small non-tidal wetland, seep, or hydric soil patch 3 other land cover, and tidal wetland is not an island 1 tidal wetland occupies nearly all of an island 0  * wider than the tidal wetland (width measured perpendicular to slope)	sum = score 0 = 0.01 1 = 0.1 2 = 0.2 3 = 0.3 4 = 0.5 5 = 0.7 6 = 0.8 7 = 0.9 8 = 1.00 score #36:	Do not count major rivers adjoined by the wetland as freshwater sources. Perennial tributaries flow year-round most years. Intermittent tributaries flow seasonally and have recognizable channels extending uphill at least twice the width of the tidal marsh. Non-tidal wetlands on the Oregon Coast are typically dominated by alder, willow, cattail, skunk cabbage, slough sedge, small-fruited bulrush, and water parsley (some of these occur to a lesser degree in tidal wetlands). Adjoining means present within 10m.  Oregon coastal soils considered to be hydric are Blacklock, Bragton, Brallier, Brenner, Chetco, Clatsop, Coquille, Depoe, Fluvaquents, Hebo, Heceta, Langlois, Riverwash, Willanch, and Yaquina. Many others contain hydric inclusions.
		certainty #36:	Used for: AProd, Affsh, NFW, Dux, LbirdM, [WQ, Xpt, Inv, Mfish, Rfish, Sbird].

37. Width	3 7 77					0000000000	3
	Wetland's	Wetland's width at its widest part	videst par	÷		score #37:	Measure this as a perpendicular line from aquatic (unvegetated river or hav edge or tideflat) to inland
		width ft.	score	width ft.	score		edge. If site is an island with no upland, measure to the
		<100	0.01	002-009	9.0	7.0	water edge on opposite side of the island.
/E		100-200	0.1	700-800	0.7		
		200–300	0.2	800-900	8.0	containte #97.	
		300 400	0.3	900-1,000	6.0	certainty #37.	
		400-500	0.4	>1,000	1.0	1600	
		200-009	0.5				Used for: WQ, Xpt, Dux, Sbird.
38.	Maximum	Maximum width of largest tideflat	st tidefla	it that adjoins the wetland:	he wetland:		Measure this using a USGS topographic map or
MudW						score #38:	(preferably) field observation at low tide, as a
		width ft.	score	width ft.	score	5	perpendicular to the external edge of wetland, or
		<100	0.01	002-009	9.0		measure it to the external edge of other wetlands or flats
		100-200	0.1	700-800	0.7		on either side (contiguous to the wetland being
		200-300	0.2	800-900	. 0.8	confesions #20.	measured).
		300 400	0.3	900-1,000	6.0	certainty #30:	
		400-500	0.4	>1,000	1.0		
		200-009	0.5				Used for: NFW, Sbird.
30	[Clin if the	[Clin if the westland combains an low marty	of one orie				
Don't	om n divel	wellalld collin	ams no ic	w marsn.j		•	Include these 11 they occur within the wetland as well.
Topos	center of the	types of poter e wetland (ch	ntial <b>snor</b> eck all th	number of types of potential <b>snorebirg roosts</b> w center of the wetland (check all that are present);	Number of types of potential <b>snorebird roosts</b> within 1.5 mi, of the center of the wetland (check all that are present):	0 = 0.01 1 = 0.25	
						2-3 = 0.50	
	N treeless	high marsh, r	nostly wi	treeless high marsh, mostly wider than 300 ft		4-5 = 0.75	
	N treeless	uninhabited i	slands (d.	treeless uninhabited islands (dry at high tide)		6-7 = 1.00	
	△ beaches	or bars, most	lly wider	beaches or bars, mostly wider than 100 ft at high tide	high tide		
	N nontida	marsh/pond,	mostly w	nontidal marsh/pond, mostly wider than 300 ft	ff	score #39:	
	1 unveget	unvegetated dike or jetty	etty			176	
- 1	N seasona	seasonally flooded pasture >40	ısture >4(	) acres		2.5	
	Sewage	sewage treatment lagoon	oon				
	)	)				certainty #39:	
	Add the nur	nber of check	marks an	d use scale at	Add the number of checkmarks and use scale at right to derive score		
1							
							Used for: Sbird.

- 1	Indicator		score	guidance
	Wetland comprises all or part of an uninhabited island:			Island = land not permanently flooded and
	description	score		water at least 3 ft deep and 20 ft wide
	wetland comprises all or part of island; and the island 0.	0.01		4
	contains essentially no high marsh or undeveloped upland,			
	i.e., is completely underwater during daily high tide		score #40:	
	wetland comprises all or part of island; and the island 0.	0.33		
	contains some high marsh and/or undeveloped upland, this		0.1	
	being less than the area of low marsh			
	_	99.0	4.4	
	contains some high marsh and/or undeveloped upland, this		certainty #40:	
	being greater than the area of low marsh			Used for: Inv. Dux, LbirdM. [Afish. Mfish. Rfish.
	wetland does not comprise all or part of island 1.	1.00		Sbird, NFW1.

Direction and distance of external edge's exposure to intense wave and/or river current action.  Enter the maximum appropriate number in the box to the right.  SE, S, or SW exposure, and distance is: <pre></pre>	code	indicator				score	quidance
SE, S, or SW exposure, and distance is:   <a href="text-align: red;">&lt; 4100'</a>   <a href="text-align: red;">0.01</a>   <a href="text-align: red;">0.01</a>							

Pform the property of the prop		The state of the s	
21/21 T 2	Number of easily-recognizable vegetation structures present within the wetland. Check all that predominate over at least 100 sq.ft:    large robust grass-like plants (e.g., bulrush, cattail)   other large native grass-like plants (mostly >8 inches long, e.g., Deschampsia, Hordeum, Juncus)	0-2 = 0.01 3 = 0.25 4 = 0.50 5 = 0.75 6 = 1.00 score #42:	Nurse logs = large logs or stumps present on the marsh surface which, because of the elevated substrate they provide, protect germinating plants on top of the log from potentially lethal long-duration flooding and high salimity.
	Derive score by comparing the number of items checked above with the scale in the next column.		Used for: AProd, Xpt, Inv, Dux, LbirdM, [WQ, Afish, Mfish, Rfish, NFW, Sbird].
FormDiv o v v v v v v v v v v v v v v v v v v	Number of easily-recognizable vegetation forms within the wetland or directly adjoining its upland edge, from this list. For live vegetation, these must be present along >5% of upland edge or that comprise >5% of the wetland area:    grazed or mowed grass and/or forbs   x ungrazed & unmowed grass and/or forbs   x hrubs 2-6 ft tall, conifer   x shrubs 2-6 ft tall, conifer   x shrubs 6-20 ft tall, deciduous   x standing snags, >6" diameter   x standing snags, >6" diameter	1 = 0.01 2 = 0.2 3 = 0.3 4 = 0.4 5 = 0.5 6 = 0.6 7 = 0.7 8 = 0.8 9 = 0.9 >9 = 1.0 >9 = 1.0 certainty #43:	Directly adjoining = unobscured by a tree canopy.  Used for: Inv, LbirdM, [Afish, Mfish, Rfish, NFW.

code	indicator	Score	quidance
44.	Percent of upland edge bounded (within 50 ft.) by alder:		Other deciduous plant species known to fix nitrogen
Jan Carlo	% score	score #44:	(not simply take it up from the soil) may be included as $well$
	<1 (or no upland) <b>0.01</b>	10.0	WOLL.
	1-10 0.33		
	10-50 0.66		
ή -	>50 1.00	certainty #44:	
			Used for: Inv, [Afish, Mfish, Rfish, NFW, Sbird, LbirdM].
45.	Presence of eelgrass (either species):		Based either on observations from shore (up to 50 ft.
Eelg		score #45:	away), boat, or published reports or maps. "Certainty"
	presence score		should be scored low if no eelgrass is detected because
	not detected 0.01	0.0	detection at a distance can be difficult or impossible
	observed only in adjoining waters or flats 0.50		, and the same of
	observed within the wetland's internal channels 1.00	certainty #45:	
			Used for: Inv, Dux, [Afish, Mfish, Rfish, NFW, Sbird, LbirdM].
46. SoilFine	Predominant soil texture in most of the wetland:		Assess this from county soil survey maps, unless better
	soil texture score	score #46:	12 inches of the soil of source locations of the upper
		0.40	12 inches of the son at several locations in the welland.
	fine sand 0.40		Predominant = occurving the greatest proportion of the
	silt, loam, muck, peat 1.00	certainty #46:	surface area of a site.
			Used for: WQ.

score #47: 0.66 0.66 certainty #47:	code	indicator		score	quidance
8core #47: 0.66  certainty #47:	47. EstuSal	Tidal marsh acreage in this wetland's major estuary:			The salinity zones are not based on salinity within the wetland, but rather in the adjoining bay or river.
0.01  score #47:  0.66  certainty #47:	lije T		core		
0.66 Score #47:			0.01		These categorizations of estuaries are based on very
0.66 Score #47:		three salinity zones (fresh, brackish, saline):			limited salinity data and may be revised.
0.66 Certainty #47:		Netarts, Siltcoos, Tenmile, Elk River, Chetco.			
0.66 Certainty #47:			).33		
0.66 certainty #47:		three salinity zones, with one of the two remaining zones			
0.66 certainty #47:		having much more marsh acreage than the other:			
0.66 certainty #47:	7.0	Sand Lake, Salmon, Beaver Cr., Coquille,		score #47:	
0.66 certainty #47:		New River, Rogue, Winchuck.		111	
1.00 certainty #47:			99'(	9	
1.00 certainty #47:		containing more than 50% of the estuary's marsh acreage:			
1.00		Nehalem, Tillamook, Nestucca, Yaquina, Alsea, Coos.		Containts 447.	
112			00.1	certainty #47.	
	10 mm	containing more than 50% of the estuary's marsh acreage:			Used for: Afish, Mfish, Rfish, [WO, Inv. NFW, Sbird.
		Necanicum, Siletz, Siuslaw, Umpqua.			LbirdM].

code	indicator	score	guidance
48. SeaJoin	Estuary connection with ocean.		
	description score	score #48:	
	Estuarine connection to ocean is lost regularly, at least once	90'-	
	Usually connected to ocean and almost the entire estuary is 0.50		
	(as in some "bar built" estuaries).	certainty #48:	
	Always connected to ocean, with much freshwater input from 1.00		
	feeder streams and/or river.		Used for: Afish, Mfish, [NFW].
49.	Relative dominance of undiked tidal wetlands in this estuary.		Numbers were based on ratio of tidal marsh to
Estu%WL			subtidal water, as well as on total acres of tidal
	Use the score from the appropriate estuary in this list:	The state of the s	marsh. They do not account for previous
		score #49:	extent or historical losses of tidal wetlands.
	Alsea = $0.8$ ; Beaver Cr = $0.9$ ; Chetco = $0.1$ ; Coos Bay = $0.7$ ;		
	Coquille = 0.5; Ecola = 0.5; Elk R. = 0.3; Euchre-Greggs Cr. = 0.3;		
			7
		certainty #49:	
	Sand Lake $= 0.3$ ; Siletz $= 0.9$ ; Siltcoos $= 0.5$ ; Siuslaw $= 1.0$ ;		
	Sixes= 0.2; Ten Mile = 0.8; Tillamook = 0.6; Two Mile = 0.4;		Trad for: A figh (NEW)
	Umpqua = $0.7$ ; Winchuck = $0.1$ ; Yaquina = $0.8$		Caca ioi. Ailait, [ivi w].

code	indicator	score	quidance
50. WetField%	Percent of land within 1.5 mi. that appears (in a 1:24,000 scale aerial photograph) to be <b>ponds</b> , lakes, nontidal marsh, sewage lagoons, cropland, or pasture in flat terrain.	score #50:  0 0    certainty #50:	Flat terrain = slopes less than about 10%.  After drawing a circle of 1.5 mi. radius from the wetland center (4 inches on a 1:24,000 scale aerial photograph or map), measure the acreage of the named cover types and divide by 45.24 to get the percent. Performing this measurement with a GIS is preferred.  If no access to aerial photographs, attempt to estimate but score certainty "0.01".  Used for: NFW, Sbird, Dux.
51. BuffCov	Percent of the area surrounding this wetland that appears (in a 1:24,000 scale aerial photograph) to be developed or persistently bare.    \$\int 5\%   6-14\%   15-24\%   >25\%     within 1500 ft: 0.50   0.25   0.15   0.10     within 3000 ft: 0.50   0.20   0.10   0.01     Select one number from each row and sum them to derive the score.	score #51: 0 . 1 (c) certainty #51: (0 . 0 (	Developed = lawns, landscaping, pavement, buildings. Persistently bare = bare compacted soil or rock (not sand dunes).  After drawing a circle of 1500 ft. outward from the wetland center (3/4 inch on a 1:24000 aerial photograph or map), subtract from 162 acres (the area of the circle) the acreage of any included tidelands. Then divide the developed acres you measured by this number. Do likewise for the 3000' circle, but substitute 650 for 162. Multiply the results by 100 to get percent. Performing this measurement with a GIS is preferred. If no access to aerial photographs, attempt to estimate but score certainty "0.01".  Used for: NFW, LbirdM.

code	indicator	score	guidance
52. BlindL	Internal channel complexity.		Blind channels = channels located entirely within the wetland
	While viewing a 1:24,000 scale aerial photograph, imagine		incoming tide.
	all the wetland's blind channel segments strung end-to-end		
	and straightened out. Relative to the wetland's width, would		Width = the wetland's maximum width measured
	their cumulative length be;		perpendicular to adioining hav or river
		score #52:	
	length relative to width score		If no access to agrial photographs attempt to estimate hut
	less than half (50%) 0.01	0 0	score certainty "0 01"
	50-100% 0.20		
	1-1.9 times longer 0.40	Andre Men	
	2-2.9 times longer <b>0.60</b>	certainty #52:	
	3-3.9 times longer <b>0.80</b>		Used for: AProd, WO, Xpt, Inv, Afish, Mfish, Rfish, INFW.
	>3.9 times longer <b>1.00</b>		Sbird, LbirdMJ.

code	indicator	Ţ			score	auidance
53.	Number	Number of internal channel exits	nnel exits.			Exits = where internal channels flow into unvegetated waters
Exits	Count the	se using a 1:24	4000 aeria	Count these using a 1:24000 aerial photograph and enter in	- 411	or tideflats outside of the wetland.
	the botton	the bottom box ("datum") in the next column.	") in the n	next column.		External wet edge length is measured as the wetland's edge
	Then in the	he top row of the	he relevan	Then in the top row of the relevant table below (A or B), find		that connect at both ends to a tideflat or unvegetated bay or
	channel e	nd edge length. <i>xits</i> this wetlan	. In that c id has. Th	channel exits this wetland has. Then look along that row to	Y	river, count both ends as exits. Do not count constructed drainage ditches.
	the last co	the last column for the resulting score.	esulting si	core.		
	A. Wetla	A. Wetlands on <b>silt</b> , <b>clay</b> , <b>or muck</b> substrate:	y, or muc	ck substrate:		IMPORTANT: The number of exits is strongly related to marsh size, substrate type, and HGM subclass—sometimes
	length c	length of external wet edge (ft)	adge (ft)			even more than to march dicturbance. See note for #60
	<1000,	1000-3400'	>3400'	score	erore #53.	above
	0 exits	0 exits	0 exits	0.01		above.
		1-2	1-3	0.25	0.0	- 71
	2	3-5	9-4	0.50		If no access to aerial photographs, attempt to estimate but
	34	6-10	7-12	0.75		score certainty "0.01".
	*	>10	>15	1.00	certainty #53:	
	B. Wetlan	B. Wetlands on sand substrate:	ibstrate:			
	exits	score				
	0	0.01			dafiim #53.	
	7	1.00				Used for: AProd, WO, Xpt, Inv. Afish. Mfish. Rfish. INFW.
					0	Sbird, LbirdMJ.

code	indicator	score	guidance
54. JuncMax	Number of internal <b>channel junctions</b> .  Count these along the single longest internal channel, using a		Junctions = visible confluences between two internal tidal channels regardless of their relative sizes.
	("datum") in the next column.		Do not count constructed drainage ditches.  Important: The number of channel important is about to
	Then in top row of the relevant table below (A or B), find the wetland area. In that column find the number of channel <i>junctions</i> this wetland has. Then look in along that row for the last column for the resulting score.		related to marsh size, substrate type, and HGM subclass – sometimes even more than to marsh disturbance. See note for #52, above.
	A. Wetlands on silt, clay, or muck substrate:         wetland area (acres)       score         < 8	score #54:	If no access to aerial photographs, attempt to estimate but score certainty "0.01".
	hstrat	certainty #54:	
	junctions         score           0         0.01           1         0.50           >1         1.00	datum #54:	Used for: AProd, WQ, Xpt, Inv, Afish, Mfish, Rfish, [NFW, Sbird, LbirdM].
55. FreshSpot	Internal freshwater.  At a given point in time, the maximum difference between salinity in unconfined waters within the wetland vs. outside the wetland is:	score #55:	Measure salinity from tidal water (internal channel or pool), preferably around the time of low tide, and subtract from salinity measured (almost) simultaneously in the adjoining bay or river. If possible, repeat during other seasons and use the greatest differential, which often is in mid-summer. Do not measure if any rainfall has occurred in last 24 hours.
	internal is <10 ppt fresher, or is more saline 0.01 internal is 10-20 ppt fresher 0.50 internal is >20 ppt fresher 1.00	0 ,50 certainty #55:	If no access to a refractometer, attempt to categorize based on any observed sources of freshwater input, but score certainty "0.01".
		10.0	Used for: AProd, Afish, NFW, Dux, LbirdM, [WQ, Xpt, Inv].

Primary Production and Exporting Aboveground Production

highest function value	suggested score (0 to 1)	lowest function value
The wetland's tidal marsh plants are extensively and sustainably grazed, and livestock are an important part of the local economy.	#101:	✓ The wetland currently is not grazed and, due to wetness or its location, has little potential as pasture.
The wetland's estuary has not experienced major die-offs of marine animals as a result of diminished dissolved oxygen.	#102:	The wetland's estuary has experienced frequent and major die-offs of marine animals as a result of diminished dissolved oxygen, and the wetland is near the estuary mouth or other areas where this has occurred.
Uplands in this estuary, especially those closest to the water, are largely devoid of vegetation, e.g., sand dunes, pavement.	#103:	Uplands in this estuary are completely vegetated.
The site is one of only a few, or is one of the largest ones, of its subclass* in this estuary that supports and exports primary production to at least this degree.	#104:	Sites of this subclass and size that support and/or export primary production to this degree are relatively abundant in this estuary.
Other factors suggest that primary production specifically from this wetland is of unusually great importance to food webs located in the wetland or in receiving waters of the adjoining estuary or river. Explain:	#105:	Other factors suggest that primary production specifically from this wetland is not especially important to food webs located in the wetland or in receiving waters of the adjoining estuary or river. Explain:

<sup>\*</sup> Tidal wetlands are provisionally labeled by their HGM subclasses in maps on the accompanying DVD.



Maintaining Element Cycling Rates and Pollutant Processing and Stabilizing Sediment

highest function value	suggested score:	lowest function value
opportunity to perform these functions:		
Element inputs to the wetland may be relatively large as suggested by a score of 1.00 for items NutrIn, ChemIn, BuffAlt, and/or SedShed in the accompanying spreadsheet.	#106:	Element inputs to the wetland may be relatively small as suggested by a score of 0.01 for NutrIn, ChemIn, BuffAlt, and/or SedShed.
Large populations of salmon spawn very near the wetland.	#107:	Populations of spawning salmon are absent from this river basin.
Substantial volumes of woody and other organic matter enter the river or estuary a short distance upriver from the wetland as a result of recent fires, logging, or other factors.	#108: . A	Inputs of woody and other organic matter to the wetland are probably at or below historical (presettlement) rates.
Validated computer models of watershed processes indicate major net influx of sediments, nutrients, or metals to this estuary and wetland.	#109: M A	Validated computer models of watershed processes indicate no major delivery of sediments, nutrients, or metals to this estuary or wetland.
significance of this wetland (assuming these		
The site is near the estuary's main head of tide.	#110:	The site is near the estuary mouth (where its individual effect, if any, may be dwarfed by marine circulation).
Rapid sedimentation and shoaling near the mouth of this estuary is a major concern and expense and/or the estuary is regularly dredged.	#111: • 2	✓ Sedimentation and shoaling near the mouth of this estuary are not a major concern or expense; no dredging occurs.
The wetland's estuary has experienced frequent and major die-offs of marine animals as a result of diminished dissolved oxygen. The	#112:	✓ The wetland's estuary has not experienced major die-offs of marine animals as a result of diminished dissolved oxygen.
wetland is capable of processing internally much of the carbon it produces or imports, and thus avoids contributing to this problem. The wetland also is near the estuary mouth or other areas where severe oxygen deficits have occurred.	. 2	not 100%. Sure
The wetland is one of only a few of its subclass and size in this estuary that may stabilize sediments, remove nitrogen, and/or process carbon & pollutants to this or greater degree.	#113:	Wetlands of this subclass and size, that remove nitrogen or process carbon & pollutants to this or greater degree, are abundant in this estuary.
Other factors suggest that element cycling and removal functions of this wetland are of unusually great importance to biological or human resources in the wetland or in receiving waters of the estuary or river. Explain:	#114:	Other factors suggest that element cycling and removal functions of this wetland are not atypically important to biological or human resources in the wetland or in receiving waters of the estuary or river Explain:

opp. .6 519. .8

Maintaining Invertebrate Habitat (nothing yet - next month)

highest function value	suggested score:	lowest function value
This estuary ranks as one of the best for revenue and/or jobs from harvesting of crabs and other native mobile invertebrates.	#115: 0.2	This estuary supports little or no revenue and/or jobs from harvesting of native crabs and other native mobile invertebrates.
The wetland is one of a very few known on the Oregon coast known to be used by a particular native invertebrate species, and it otherwise supports a normal assemblage of invertebrates	#116:	All invertebrate species known from this wetland are widespread in tidal wetlands of the Oregon coast.
A large portion of the uplands and deeper waters near this wetland have very limited capacity to support invertebrates, e.g., largely devegetated, chemical contamination, frequent soil or sediment disturbance.	#117:	✓ Upland and deepwater areas near this wetland have considerable capacity to support invertebrates, e.g., land cover is mostly unaltered, sedimentation is normal, there is little or no chemical contamination.
The site is one of only a few, or is one of the largest ones, of its subclass in this estuary that support native invertebrates to this or greater degree.	#118:	Sites of this subclass and size that support native invertebrates to this or greater degree are relatively abundant in this estuary.
Other factors suggest that invertebrate species or densities produced at this site are of unusually great importance to food webs or ecological processes in the wetland or its estuary. Explain:	#119:	Other factors suggest that invertebrate species of densities produced at this site are not atypically important to food webs or ecological processes in the wetland or its estuary. Explain:

Cathleen Williamsm - SWCA. 0.2

Maintaining Anadromous Fish	ted in the	ert ot
highest function value	suggested score:	lowest function value
✓ One or more federally listed anadromous fish species or subpopulations are known to use this particular wetland frequently and extensively during critical periods.	#120:	No federally-listed anadromous fish species (or recognized subpopulation) is known from the wetland or nearby waters.
In the past, considerable funds have been expended to restore or enhance this particular wetland specifically for (among perhaps many objectives) anadromous fish.	#121:	In the past, no funds have been expended to restore or enhance this particular wetland specifically for anadromous fish.
The site is one of only a few, or is one of the largest ones, of its subclass and size in this estuary that supports anadromous fish to this or greater degree.	#122:	Sites of this subclass and size that support anadromous fish to this or greater degree are relatively abundant in this estuary.

juveriles har present.

Maintaining Habitat for Resident Fish and Maintaining Habitat for Visiting Marine Fish

highest function value	suggested score:	lowest function value
This estuary ranks as one of the best for revenue and/or jobs from harvesting of resident and visiting marine fish.	#123:	This estuary supports little or no revenue and/or jobs from harvesting of resident and visiting marine fish.
The wetland is one of a very few on the Oregon coast known to be used by a particular non-anadromous fish.	#124:	All non-anadromous fish species known from this wetland are widespread in tidal wetlands of the Oregon coast.
The wetland or closely connected waters provide some of the most consistently productive fishing for native tidal marsh fish species and/or marine species on the Oregon coast.	#125:	Site does not provide atypically productive fishing for any native tidal marsh fish species or marine species on the Oregon coast.
The site is one of only a few, or is one of the largest ones, of its subclass in this estuary that supports non-anadromous fish to at least this degree.	#126:	Sites of this subclass and size that support non- anadromous fish to this degree or greater are relatively abundant in this estuary.
Other factors suggest that non-anadromous fish species or densities of native mobile invertebrates inhabiting the wetland are of unusually great importance to food webs or ecological processes in the wetland or closely connected waters. Explain:	#127: . A	Other factors suggest that non-anadromous fish species or densities of native mobile invertebrates inhabiting the wetland are not atypically important to food webs or ecological processes in the wetland or closely connected waters. Explain:

Resident - yes soulpin/ Florinder Sticker brack.

### Maintaining Habitat for Ducks and Geese and Maintaining Habitat for Shorebirds

Some potential sources of data:

www.ohjv.org/pdfs/northern\_oregon\_coast.pdf www.ohjv.org/pdfs/southern\_oregon\_coast.pdf www.oregoniba.org/ www.oregoniba.org/links.htm www.wetlandsconservancy.org/oregons\_greatest.html audubon2.org/webapp/watchlist/viewWatchlist.jsp

highest function value	suggested score:	lowest function value
The wetland is consistently and/or extensively used by many waterbird species that are regionally uncommon and/or have declining populations in the Pacific Northwest.	#128:	All waterbird species that regularly use the wetland are common and widespread over most of the Oregon coast, and the wetland is distant from areas used by waterbird species that are regionally uncommon and/or have declining populations in the Pacific Northwest.
The wetland is one of a very few that contains habitat conditions identified as optimal for one or more particularly rare and/or regionally declining waterbird species.	#129:	The wetland does not contain habitat suitable for any particularly rare and/or regionally declining waterbird species, nor is it near such areas.
The wetland or its estuary was identified as being of exceptional importance for waterbirds by the Oregon Wetland Joint Venture Plan, North American Waterfowl Management Plan, or the North American Shorebird Plan.	#130:	Neither the wetland nor its estuary was identified as being of exceptional importance for waterbirds by the named documents, and is distant from such areas.
The wetland or its estuary is registered or has been formally proposed as an Important Bird Area (IBA) of the National Audubon Society.	#131:	The wetland is not within an estuary that is registered or formally proposed as an IBA, and is distant from such areas.
Other factors suggest that waterbird species or densities at this site are of unusually great importance to food webs or ecological processes in the wetland or estuary.	#132: , A	Other factors suggest that waterbird species or densities at this site are not atypically important to food webs or ecological processes in the wetland or estuary.
In the past, considerable funds have been expended to restore or protect specifically the suitability of this particular wetland for (among perhaps many objectives) waterbird habitat.	#133:	✓ In the past, no funds have been expended to restore or protect specifically the suitability of this particular wetland for waterbird habitat.
The site is one of only a few, or is one of the largest ones, of its subclass in this vicinity that support waterbirds to this degree.	#134:	Sites of this subclass and size that support waterbirds to at least this degree are relatively abundant in this estuary and elsewhere on the Oregon coast.

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Chiniak Bay is but not the estuay.

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### Maintaining Habitat for Native LandBirds, Small Mammals, and Their Predators and Maintaining Habitat for Nekton-feeding Birds

Some potential sources of data:

oregonstate.edu/ornhic/ www.oregoniba.org/ www.oregoniba.org/links.htm audubon2.org/webapp/watchlist/viewWatchlist.jsp

highest function value	suggested score:	lowest function value
The wetland is consistently and/or extensively used by native land bird or mammal species that are listed as Threatened, Endangered, or Sensitive, or are recognized as conservation priority species or communities by Partners-in-Flight or the Oregon Natural Heritage Program.	#135:	No such species or communities are present in the wetland or nearby parts of the estuary.
Other native land bird or mammal species that are regionally uncommon and/or have declining populations in the Pacific Northwest are consistently and/or extensively present in the wetland.	#136: D	All native land bird or mammal species that use this wetland occur widely on the Oregon coast and none are known to be declining at a regional scale.
The wetland is one of a very few that contains habitat conditions identified as optimal for one or more particularly rare and/or regionally declining wetland-associated bird species (other than waterbirds).	#137:	The wetland does not contain habitat suitable for any particularly rare and/or regionally declining, wetland-associated bird species (excluding waterbird species).
Other factors suggest native land bird or mammal species or densities at this site are of unusually great importance to food webs or ecological processes in the wetland or its estuary.	#138:	Other factors suggest that native land bird or mammal species or densities at this site are not atypically important to food webs or ecological processes in the wetland or its estuary.
In the past, considerable funds have been expended to restore specifically the suitability of this particular site for (among perhaps many objectives) wetland-associated native land birds or mammals.	#139:	✓ In the past, no funds have been expended to restore specifically the suitability of this particular site for wetland-associated native land bird or mammal species.
The site is one of only a few, or is one of the largest ones, of its subclass in this vicinity that support wetland-associated native land bird or mammal species to this degree.	#140:	Sites of this subclass and size that support native land bird or mammal species to this degree are relatively abundant both locally and regionally.

. 2

Brown Bear -mostly u.s. of estiony Bald Bage -feed on Salmon.

Hard to

### Maintaining Natural Botanical Conditions

Some potential sources of data:

www.oregonstate.edu/ornhic www.npsoregon.org cladonia.nacse.org/platlas/jclass/OPAJava20.htm ocid.nacse.org/cgi-bin/qml/herbarium/plants/vherb.qml

highest function value	suggested score:	lowest function value
Site contains many native plant species or associations that are uncommon and/or have declining populations in Oregon coastal tidelands. This may include, but is not limited to, species categorized as G1, G2, S1, or S2 by the Oregon Natural Heritage Program.	#141:	All plant species and associations at this site also occur widely in Oregon coastal tidelands, and none have been documented to be declining in the ecoregion.
Site is one of a very few that contains habitat conditions identified as optimal for one or more particularly rare and/or regionally declining native plant species or associations. This includes, for example, sites with extensive woody vegetation (especially Sitka spruce) that are regularly flooded by tides. In Oregon this is a relatively rare type of wetland that has declined dramatically.	#142:	Site does not contain habitat suitable for any particularly rare and/or regionally declining native plant species or association.
Other factors suggest that native plants at this site are of unusually great importance to food webs or ecological processes located onsite or in the region generally.	#143:	Other factors suggest that native plants at this site are not atypically important to food webs or ecological processes located onsite or in the region generally.
The site is one of only a few, or is one of the largest ones, of its subclass in this estuary that support native tidal vegetation to this degree.	#144:	Sites of this subclass and size that support characteristic vegetation to this degree are relatively abundant both in this estuary and regionally.
In the past, considerable funds have been expended to restore specifically the suitability of this particular site for unusual or characteristic native plant species or associations.	#145:	In the past, no funds have been expended to restore specifically the suitability of this particular site for native plant species.

### Other Factors Potentially Relating to Value or Concern

A potential source of data:

www.coastalatlas.net/metadata/TidalWetlandsofOregonsCoastalWatersheds, Scranton, 2004.htm

highest concern	suggested score:	lowest concern
Loss of tidal wetlands has been greater in this estuary than in any other on the Oregon Coast.	#146: 0.2	Loss of tidal wetlands has been less in this estuary than in any other on the Oregon Coast.
This wetland is the only one of its HGM subclass in this estuary.	#147:	This wetland belongs to an HGM subclass that is the most common one in this estuary.
The wetland belongs to an HGM subclass that has experienced the most losses of any tidal HGM subclass in this estuary.	#148:	The wetland belongs to an HGM subclass that has experienced the lowest losses (or greatest gain) of any tidal HGM subclass in this estuary.
The entire wetland is designated as a Hazardous Waste Site.	#149: 0 :2	No portion of the wetland or its immediate tributaries is designated as a Hazardous Waste Site.
Much of the wetland is known to contain artifacts of high archaeological importance.	#150: 0 · 0	None of the wetland is known to contain artifacts of high archaeological importance.
The wetland is visited by many people engaging in activities that are compatible (in moderation) with its natural functions, e.g., kayaking, educational tours, hunting, fishing, birding.	#151:	The wetland is almost never visited, or is visited to such a large degree that some functions are impaired.

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### HGM Rapid Assessment Report Data Collection Sheets

The following list and data collection sheets are necessary for completing an HGM Rapid Assessment Report

- Step 1. Preliminary HGM Classification (Riverine)
- Step 1 Preliminary HGM Classification (Slope River Proxi.)
  - Step 2. Site Information (completed in the office or field)
- Step 3. Sketch a Map of Project Assessment Area.
- Variable (15) Vegetative Cover (Vvegcov) worksheets. Pebble Count & Embeddedness Work Sheet
  - Riverine Variable Scoring Sheet
    - Slope Variable Scoring Sheet
- Riverine Functional Scoring Sheet
- Slope Functional Scoring Sheet 10)

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## (1) Step 1. Preliminary HGM Classification

Identify, verify, and document the rationale used for recognizing HGM classes and subclasses within the project assessment area. Determine if the assessment area is a RIVERINE and/or SLOPE RIVER PROXIMAL Wetland Subclass by using the dominant characteristics outlined below.

Show how the project assessment area satisfies a subclass definition provided in the guidebook by completing the form below. Specifically, include a discussion of the site characteristics and show how they are consistent with the dominant characteristics of the subclass.

### Riverine Wetland Dominant Characteristics

CHARACTERISTIC	DESCRIPTION
Hydrologic Source	Unidirectional flow, higher order streams, derived from non-glacial water sources
Vegetation	Any vegetation life form (e.g., trees, shrubs, herbaceous, etc.) that are not in a marine, or estuarine system, nor directly influenced (i.e., actively flooded) by those systems.
Landforms	Occur in valley bottoms, flow predominantly on bedrock, glacial till or glacial marine deposits. Low elevation stream reaches may flow on Pleistocene or Holocene alluvial gravel deposits, or deltaic estuarine deposits raised in elevation by tectonic lift.
Slope	$0.001\%$ to $\leq 2.2\%$
Parent Materials	Upper reaches: exposed bedrock, glacial till, and colluvium over bedrock, alluvial sand, and gravel. Lower reaches: dense basal till, marine lucustrine and glacial fluvial sediments, and alluvial sand and gravel.
Soils	Sand, silt, and gravel deposits with occasional surface organic matter accumulation.

Provide the site Characteristics:

Hydrologic Source	higher order streams & most
Vegetation	Pipmian veg w/ Will m, Alder, Sonce
Landform, soils	bed rock and awwall deposits.
Slope	average drawned stope to. 0.2%

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CHARACTERISTIC	DESCRIPTION
Location	Located within 200 feet of the bankfull of a river channel.
Hydrologic Source	Ground or surface water flow.
Vegetation	Any vegetation life form (e.g., trees, shrubs, herbaceous, etc.) that are not in a marine, or estuarine system nor directly influenced (i.e., actively flooded) by those systems.
Landforms	Occur adjacent to streams and valley sides. Occur in valley bottoms, flow predominantly on bedrock, glacial till or glacial marine deposits. Low elevation stream reaches may flow on Pleistocene or Holocene alluvial gravel deposits, or deltaic estuarine deposits raised in elevation by tectonic lift.  Note: wetlands in closed depressions are out of the subclass.
Slope	0.1% to ≤25%
Parent Materials	Upper reaches: exposed bedrock, thin till, and colluvium over bedrock.  Lower reaches: dense basal till deposited by flowing glacial ice, outwash, gravel.
Soils	Sand, silt, and gravel deposits with occasional surface organic matter accumulation.

Provide the site Characteristics:

nydrologic somce	Vegetation	Landform	Slope	Parent Materials

Soils

ield or	
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(Completed	
Site Information	
Step 2.	(a)
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Field Notes/Observations

Collect and review information relevant to the site. This includes, but is not limited to:

- USGS, state, local, and other maps (at various scales)
  - · Geotechnical, soils, or environmental reports
- · Correspondence, construction plans on the proposed project
  - Published literature

Identify the documents that were collected and reviewed. Include a detailed description of each document (e.g., citation, date, scale, quadrangle name, etc.). If possible, attach copies of each document.

• USGS, state, borough, and other maps (at various scales):

- - 2.
- Air photos and other imagery:

  1. High Mes graps from Coast Good
- Relevant geotechnical, soils, or environmental reports:

  1. Wettand Delineath report 1999 Dance Amone
- Correspondence, construction plans, and specifications, etc. on the proposed

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project:

- Relevant published literature:
- Other documents:

### Other Questions:

Is a cataloged anadromous fish stream adjacent to or part of the assessment area? When  $\text{PMM}_{\text{A}}$ 

Is the assessment area used by any federally listed threatened or endangered species? Tes  ${\it BmA}$  Eagal

Is the assessment area adjacent to a state listed impaired waterbody?

Is the assessment area listed as a historic or cementary?

Possible historic after WWII on curport
assurtanted at possion Row Delta-

### Step 3. Sketch a map of Project Assessment Area 4

A Market and and and	
4	
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P.C. BANNER RODIAN	

Plus bevils creek to cultur unda a section of the Broken Piver from Christman halpers and to the Worth Devil's Creek / Lower Creek trader runnant.

## (5) 1) Median Pebble Size D50 (Vpebble-D50):

Determine the median pebble size (D50) of the samples by using the Pebble Count Table following the procedure outline above.

> 1024					%0	
512- 1024					76-100%	
257- 512						
129-				ork She	51 – 75%	
65-128			×	Embeddness Work Sheet	51-	
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32				<u> </u>	26 – 50%	×
9-16					26	
5-8						
2-4					0-25%	
>2					-0	

varius by reach from redund to sout & soul.

see section 5.3.6 WATERN WEND

D-50 = 24 - 37

I change of 0.75 barret of lightly V pedale DEO= Index = 0.5

remarkedness = 0.75

### (6) 15) Total Vegetative Cover (Vvegcov)

1) Visually estimate the total percent canopy cover by adding each strata (forested, scrub/shrub, herbaceous, and moss and lichen). within 0.1 acre using the PCQ method. For sites dominated by herbaceous vegetation and low shrub vegetation, a line intercept method is used for cover measurements.

Cover Class Midpoints are obtained from the following table:

Midpoint	0.5	3	10.5	20.5	38	63	85.5	86
% Cover	~	1-5	6-15	16-25	26-50	51-75	76-95	>95

Use the following tables to list the most common species and their estimated percent cover using the cover class midpoint.

Tree Species		Cover Class Midpoint
pica		m
Salix Spp.		63
Alnus		10.5
Populus		60
Tota	Total Cover	79,5

Species Cover Class Midpoint			Total Cover	
	Sambueus			

Surubs Strata (multiple stems) and Seedlings (<3°, single stem)	(3), single stem)
Species	Cover Class Midpoint
Sambueus racemosa	20.5
Rubius: Spectabelis	00
Total Cover	83.5

Herbaceous Strata: Forbs, Graminoids, Ferns and Fern Allies	nd Fern Allies
Species	Cover Class Midpoint
Lady fern	10.5
Total Cover	

a	Cover Class Midpoint	85,5				Yor
Mosses and Lichens Strata	Species					Total Cover
		Moss spp				

1. Total percent cover of Moss / Lichen Strata	85.5
2. Total percent cover of Herbaceous Strata	(6.5
3. Total percent cover of Shrub Strata	83.5
4. Total percent cover of Tree Strata	79.5
Total Percent Vegetative Cover	1ver 259,0

(7) Riverine Variables Scoring Sheet

		Field	Variable Index	
Variable	Units of Measurement	Measurement	Score	
Vpebble-D50	Median size	24-37	0.0	
Vchanrough	One Standard Deviation	52-110	0.75	
Vembedded	% Embedded Pebbles	25-50	0,75	
Vewpot	# of Pieces			
Coarse Wood Potential		Jan T	1.0	
Vewin	# of Pieces in Channel	74 48		
Coarse Wood in Channel		0	o V	
Vlogjams Number of Logjams	# of Logjams	0	1.0	
Vsubin	# of Features			
Surface water into the A. Area		0	0,5	
Vshade	% Riparian Shade	20-39 or	70,0	
Riparian Shade		1901-18	0.12	
Walthydro Alteration of Hydroregime	Hydrologic Connections Disturbed	dam @ Brown	1.0	
Vbarrier	Downstream Barriers	0	0,0	Hasmy
Vfreq	# of Features		0.5	France
Vstore	# of Features	÷	0.5	
Vsoilperm Soil Permeability	Soil Features	Sandey	0.1	
Vtreeba Tree Basal Area	Est. of Basal Area		00.	
Vvegcov Total Veg. Cover	Sum of % of Six (6)		1.00	
Vstrata	# of Veg. Strata		5	,
Vegetation Strata			25.	
Vwetuse	% of Area Disturbed	190	0.00	
Assessment Area Land use		200	e U	
Vwatersheduse	% of Area Disturbed			
Land use in Watershed		200	0,73	

(8) Slope Riverine Proximal Variables Scoring Sheet

Variable	Units of Measurement	Field Measurement	Variable Index Score
Vredox Redoximorphic Features	Presence or Absence		
Vacro Acrotelm Layer	Presence & Structure		
Vsoilperm Soil Permeability	Condition of Soil		
Vsource Water Source	% and Category of Observed Land Use		
Vsubout Subsurface Water Flow Out	Evidence of Subsurface Flow		
Vfreq Flood Frequency	Indicators of Frequent Flooding		
Vstore	Ratio of Flood Prone Area		
Vwetuse Assessment Area Land Use	Inches (cm)		
Vadjuse Adjacent Land use	Degree of Slope		
V <b>micro</b> Microtopography	Ratio of Observed Angle of Impacted Area		
Vsurwat Surface water	Surface Water		
Vvegcov Total Veg. Cover	# per Site		
Vstrata Vegetation Strata	% Features, Presence of Ponding		
Vgaps Canopy Gaps	Sum of % of Six (6) Vegetation Covers.		
Vtreeba Basal Tree Area	% of Hydrologic Connections Disturbed		
Vdecomp Log Decomposition	% and Category of Observed Land Use		=
Vcwslope Coarse Wood	# of Pieces of Coarse Wood		

### (9) Riverine Functional Scoring Sheet

Functional Capacity Index (FCI)	65.0	95.0	0,68	) 6, 0	5.0	0.65	5.0	85.0	19,0
Formulae	= (Vwatersheduse + Vwetuse+ Valthydro + Vfreq + Vchanrough + Vcwpot + Vlogjam + Vcwin) / 8	= (Vstore + Vpebble-D50 + Vlogjam + Vcwin + Vvegcov) / 5 + (Vwatersheduse + Vfreq) / 3	= (Vsubin + Vcwin + Vcwpot + Vchanrough + Vsoilperm + Vwatersheduse + Vshade) / 7	= (Vcwin + Vcwpot + Vlogjams + Vtreeba + Vpebble-D50 + Vvegcov) / 6 +(Vfreq) / 2	= (Valthydro + Vfreq + Vsubin + -(Vvegcov + Vtreeba)/2+ Vsoilperm) / 5	= (Vshade + Vchanrough + Vembedded + Vwetuse + Vsubin) / 5	= (Vcwin + Vlogjam + Vcwpot) / 3 + Vfreq) / 2	= (Vfreq + Vwetuse + Vwatersheduse + Vshade + (Vvegcov + Vstrata) / 2 + Vtreeba) / 6	= (Valthydro + Vsubin + Vwetuse + Vwatersheduse + Vbarrier) / 5
Function	1) Channel meander Belt Integrity	2) Dynamic Flood Water Retention	3) Nutrient Spiraling	4) Particulate Retention	5) Removal of Imported Elements and Compounds	6) In-Channel Biota	7) Coarse Wood	8) Riparian Vegetation	9) Connectivity and Interspersion

# (10) Slope Riverine Proximal Functional Scoring Sheet

Function	Formulae	Capacity Index (FCI)
1) Dynamic Flood Water Retention Capacity	= (Vfreq + Vcwslope + Vsoilperm + Vmicro + Vvegcov +Vstore) / 6	
2) Subsurface Water Retention Capacity	= (Vsource + (Vacro + Vsoilperm + Vdecomp)/ 3 + Vmicro + Vadjuse) / 4	
3) Nutrient Cycling	= (Vadjuse + Vsurwat + Vvegcov + (Vsource + Vsubout) / 2 + (Vacro + Vredox + Vdecomp) / 3) / 5	¥
4) Organic Carbon Export	= (Vsource + (Vacro + Vsoilperm + Vdecomp + Vredox + Vegcov) / 4+ Vsubout) / 3	
5) Integrity of the Root Zone	= $(Vsource + Vsurwat + Vacro + (Vredox + Vsoilperm) / 2) / 4$	
6) Maintenance of Wildlife Habitat Structure	= (Vvegcov + Vadjuse +Vwetuse + (Vsurwat + Vmicro) / 2 + Vstrata + (Vgaps + Vcwslope) 2) / 6	
7) Maintenance of Plants	= (Vwetuse + Vvegcov + Vsource + Vtreeba + (Vsurwat + Vacro) / 2 + (Vredox + Vsoilperm) / 2) / 6	

### Appendix B. Assessment of Function Capacity: Judgmental Method

Complete the following "qualitative assessments" of function only if you chose not to complete the reference-based assessments" that began on page 20.

Instructions: In each row, indicate with a checkmark if your site looks more like the "highest capacity" condition or the "minimal capacity" condition. Then circle a number on the scoring line below this table, based on your overall impression of the site's capacity to support this function. Alternatively, instead of checkmarks, you can assign a score to each row by placing a number in the center column of each row, e.g., 0 (minimal capacity) -to- 1.0 (highest capacity), and then combine the row scores in a manner of your choosing, perhaps weighting some rows more than others if you believe those indicators to have greater influence on a function. Whether based on mathematical operations or another way of synthesizing, be sure to circle your final score for the function on either or both of the shaded "Judgment Lines" at the bottom. Definitions of many of the terms are provided in Appendix A.

Function Capacity (Judgmental Assessment of):

Water Storage and Delay

Highest Functioning	Suggested Score:	Minimal Functioning
The proportion of the site that is inundated only seasonally is large. The seasonally-inundated parts are defined by flood marks on trees and shrubs, stunted plants, and/or distinctive assemblages of plant species.	.6	None of the site is inundated only seasonally. The site is always comprised only of permanent water or a high water table without surface water.
Most of the surface water in the seasonally- inundated zone remains for a few days after each rain event, but not less or more.	.4	Water added from rain events empties quickly from all of the site. via outlets or percolation.  This often is evidenced by: lack of flood marks on trees and shrubsscarcity of wetland plants (few FAC or wetter)
		little or no mottling of soils throughout the seasonally-inundated zonesite is located on slopesite is flat (few or no puddles, etc.)presence of outlet channels

Sediment	Stabilization	and	Phospl	horus	Retention
TT'-1	V-1			TOR EACH	TENENTE CECIE

Highest Functioning	Suggested Score:	Minimal Functioning
High score was assigned to Water Storage & Delay function (inundation is long, frequent deep, extensive).	.6	Low score was assigned to Water Storage & Delay function (water levels barely fluctuate).
Texture of the predominant substrate in the upper 12 inches of the seasonal zone is mostly clay, silty clay, sandy clay, clay Ioam, or native organic. See p. 83 for key to soil textures.	.2	V Upper 12 inches of the predominant substrate in the seasonal zone is mostly sand or gravel.
Herbs, shrubs, and/or vines together always occupy a large percent of the ground cover in the seasonal zone. Very little soil is bare.	.8	All or nearly all of the substrate in the seasonal zone is unvegetated.
Shallow pools and puddles are present and well-interspersed with herbaceous vegetation	.8	Shallow pools are absent at all times of the year
Substrates have never been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. No evidence of severe erosion within the site.	.2	X Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. Extensive evidence of severe scour or erosion may be present within the site. No sediment marks on trees or other plants.
Most of the site has complex nicrotopography (hummocks, puddles, etc.)	0	The substrate is uniformly flat, with no noticeable microtopography (no hummocks, etc.)

Your Judgments:

unction Capacity score =		or circl	e one of	the fol	lowing:	
1.0	.8	.6	(4)	.2	0	
Highest					Lowest	

### Function Capacity (Judgmental Assessment of):

Nitrogen Removal

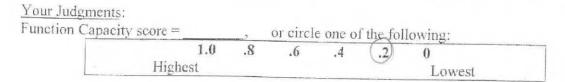
Highest Functioning	Suggested Score:	The state of the s
Note: Proceed with assessing this function only is soils/sediments are found in at least part of the si	Cmatilina	l'or other features that indicate oxygen deficits in
High score was assigned to Water Storage & Delay function (inundation is long, frequent, extensive)	.6	Low score was assigned to Water Storage & Delay function (water levels barely fluctuate)
Some surface water or saturation remains year-round or nearly so, and is dispersed around the site such that water flow paths and residence times are long.	.2	✓ No surface water or saturation remains year- round. If seasonal flooding occurs, the surface water is concentrated in one part of the site. e.g
Soil microbial processes are fairly mature, as possibly suggested by abundance of dead wood, thick and extensive soil organic layer, and many large-diameter trees	.2	channel or pond, and does not remain for long.  Y Soil microbial processes are not well-developed, as possibly suggested by lack of dead wood, thick soil organic layer, and/or large-diameter trees

Highest Functioning	Suggested Score:	Minimal Functioning
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site. None of the site was constructed from upland.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling.
Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	Most of the site has no noticeable microtopography (no hummocks, puddles, etc.)
Site is burned annually or biennially	12	Site has not been burned in recent years

Function Capacity score =	?	or circl	e one of	the fol	lowing:
1.0	.8	.6	.4	(.2)	0
Highest					Lowest

**Primary Production** 

Highest Functioning	Suggested Score:	Minimal Functioning
All of the site has vascular plants and/or water with algae.	.6	Much of the site is devoid of vascular plants and/or algae.
A variety of plant forms is present in about equal proportions (trees, shrubs, and herbs) and is well-distributed throughout the site	.2	Whatever plants are present are mainly of a single form (trees, shrubs, or herbs)
Some shallow (<3 ft) surface water remains year-round or nearly so, and in summer is dispersed around the site, e.g., many puddles	.2	The site is entirely dry during much of the year.
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe crosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling. Severe erosion may be evident within the site.
The site's contributing watershed contains no cropland, paved surface, buildings, or lawns especially in the parts closest to the site.	-2	The site's contributing watershed is almost entirely cropland, paved surface, buildings, and lawns – especially the parts closest to the site.



Thermoregulation

Highest Functioning	Suggested Score:	
and connected by surface water during summer	r riverine sites to other water	at which part of the site is permanently inundated bodies.
Entire water surface in summer is shaded by a closed tree canopy or by topography.	.2	None of the water is shaded by vegetation or topography, and all of the water is shallower than 2m during summer.
Almost the entire site consists of water deeper than 6 ft.	.2	Very little of the site contains permanent water, and it never is deeper than a few inches.

Your Judgments:
Function Capacity score = . or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Function Capacity (Judgmental Assessment of):

Resident Fish Habitat Support (NA)

Highest Functioning	Suggested Score:	
<u>Note</u> : This function may be assessed only if par Impounding.	t of the site is	permanently inundated and the subclass is Riverine
Permanent water is extensive, and the site is connected only briefly with associated channels		Permanent water is very limited
Non-native fish species are absent		Non-native species dominate the resident fish component, although some natives are present
Shallow water area and proportion of the site that is inundated only seasonally is of sufficient extent and quality to support spawning by most species, and supports high densities of aquatic invertebrates		If present, shorelines are steep, dropping sharply into water deeper than 6 ft., with little or no seasonal zone being present
Cover (aquatic plants, logs, boulders, overhanging frees, deep water spots, etc.) that provides year-round shelter from predation is abundant		Where water is present seasonally, cover that could shelter fish from predation is scarce or lacking.
Water quality (especially dissolved exygen) is excellent		Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Anadromous Fish Habitat Support (NA)

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only inundation	if part of the	site is accessible to anadromous fish during seasonal
Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth		Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth
Floodwaters remain in the site for more than a few days		No surface water remains in the site for more than a few days
Non-native fish species are generally absent		Non-native fish species predominate
Substrates suitable for spawning or feeding are extensively present		Substrates suitable for spawning or feeding are scarce or absent
Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from currents and predators is abundant, at least in the seasonal zone		Cover that provides shelter from currents and predators is scarce or lacking from all parts of the site
Water quality (especially dissolved oxygen) is excellent		Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
Summertime temperature maxima do not exceed preferred range of anadromous fish		Summertime temperature maxima exceed limits lethal to anadromous fish

Your Judgments:

Function Capacity score = _		7	or circl	e one o	f the fo	llowing	g:	
	1.0	.8	.6	.4	.2	. 0	Comment of the Commen	
Highes	st					L	owest	

Function Capacity (Judgmental Assessment of):

Invertebrate Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
Surface water is permanent or nearly permanent, AND all of the water is shallower than 2 feet during May-September*	.2	Surface water is present only briefly (RI sites or not at all (SF sites), OR nearly all of the water remains deeper than 6 ft during May-September
Cover (especially aquatic plants, woody debris) that supports algae and provides shelter from currents and predators is abundant in both the seasonal and permanent zone	.2	Cover (aquatic plants, woody debris.) that could support algae and provide shelter from currents and predators is lacking
Plant forms and species are highly diverse	.2	Only one plant form is present, and plant species richness is very low
Vegetation is well-interspersed with pools	.4	Vegetation and pools (if any) are in 2 separate areas or zones
Water quality (especially dissolved oxygen) is excellent	.2	Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Highest Functioning	Suggested Score:	Minimal Functioning
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the site was entirely constructed from upland.
Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.	.2	Surrounding landscape contains no wetlands or ponds

rueas likely to r	etain water well into the growing season may have many of these characteristics:
	prevalence of wetland plants (FAC or wetter, and especially OBL) intensive mottling & gleying of soils throughout most of the seasonally-mundated zone site is located in flatland terrain (not on slopes) site is large relative to its contributing watershed (>4% of total area) extensive microtopographic variation (many hummocks, puddles, etc.) absence of outlet channels, and/or site is managed for water storage

Your Judgments: Function Capacity score =		or circl	e one o	f the fol	lowing:
1.0	.8	.6	.4	(2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): Amphibian & Turtle Habitat

Highest Functioning	Suggested Score:	Minimal Functioning
Permanent water is absent, but shallow surface water that contains extensive partly-submerged fine-stemmed herbs¹ is extensive, and recedes very gradually during the months of January – May² (i.e., during this period, there are at least 30 days when water levels are stable or have a vertical fluctuation of <2 inches).  OR:  Permanent water is extensive and contains (a) abundant underwater cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from predation, and (b) partly-submerged fine-stemmed herbs¹	.4	Site never contains surface water  OR  Site is entirely surface water, which either (a) never fluctuates vertically (i.e., no seasonal zone is present), or (b) fluctuates too much – more than 2 inches during all 10-day periods, or (c) is devoid of any emergent herbs that are partly- submerged during the springtime, or (d) flows faster than 4 inches/second during the entire springtime, everywhere in the site, or (e) is mostly deeper than 40 inches and is bordered by a shoreline with a very steep slope
Bullfrogs and other non-native predators are absent		Bullfrogs and other non-native predators are abundant
If surface water everywhere in the site is flowing during springtime, there are at least 30 days when current velocities are slow (<4 inches/second)		If surface water everywhere in the site is flowing during springtime, there are never more than 30 days when current velocities are slow (<4 inches/second)
There is extensive and varied woody lebris in the seasonal zone	0	There is no woody debris in the seasonal zone

Highest Functioning	Suggested Score:	Minimal Functioning
Either vegetation and pools are well- interspersed during high water level, or any woody vegetation bordering the larger pools is located mostly on their north end. <sup>3</sup> Microtopography is quite varied.	.2	Vegetation and pools are in separate areas of the site during high water level, and any woody vegetation bordering the larger pools is located mostly on their south end. Microtopography is too flat to allow many puddles to form (no hummocks, etc.)
Suitable basking sites for turtles and calling sites for frogs are present	.2	There are no basking sites for turtles or calling sites for frogs
Land cover in adjoining uplands is a mix of natural grassland and woodland; woodlands have extensive and varied woody debris	.2	Land cover in adjoining uplands largely contains impervious surface, bare ground, lawns, and row crops
Shorelines are gently sloping	.4	Shorelines, if present, are mostly steep
Busy roads are distant from the site	.2	Busy roads adjoin the site
Many other wetlands (excluding flowing water) are present nearby	-2	There are no other wetlands (excluding flowing water) nearby
Water quality is excellent	•2	Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the entire site was constructed from upland.
Soils and submerged sediments contain a moderately thick organic layer (leaf litter, peat, lecomposed organics, etc.)  Emergent herbs with stem diameter of <3 mm (measured 2 mel.)	-	Soils and submerged sediments contain no organic layer, and are mostly hard-packed clay; or organic layer is so thick that water is chronically anoxic.

Emergent herbs with stem diameter of <3 mm (measured 2 inches below springtime water surface); this includes nearly all perennial herbs except catrail.

<sup>2</sup> Areas likely to retain water well into the growing season may have many of these characteristics

prevalence of wetland plants (FAC or wetter, and especially OBL)
intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
site is located in flatland terrain (not on slopes)
extensive microtopographic variation (many huminocks, puddles, etc.)
absence of outlet channels, and/or site is managed for water storage.

During the January-May period, 30 days of stable water levels are required for some aquatic amphibian eggs to mature, and during this time 3 transfer of period inches are lethal (Richter 1997).

<sup>3</sup> Vegetation located north of pools is less likely to block sunlight important to developing aquatic amphibians (Richter 1997).

* *		
Your	Judgments:	

Function Capacity score = , or circle one of the following:

1.0 .8 .6 .4 + .2 0

Highest Lowest

Function Capacity (Judgmental Assessment of):

Breeding Waterbird Support (NA) 10 Airport

Highest Functioning	Suggested Score:	Minimal Functioning
The site contains many acres of permanent or nearly permanent surface water, or a large permanent wetland (excluding streams) is located nearby		Surface water is present for only a few week during April-June, OR  Nearly all of the water remains deeper than of during May-September
AND Water depths are predominantly shallow (2 to 24 inches) in April-August*		AND No permanent wetlands are located nearby
Most of the shoreline is not steep		Most of the shoreline is steep
Larger pools of water are bordered by a wide, dense band of tall herbs and/or shrubs in April-August.		Larger pools, if present, are bordered by only a narrow band of sparse vegetation
About equal proportions of water and vegetation are present, and are well-interspersed during the April – August period		Vegetation and pools (if any) are in 2 separate areas or zones, not interspersed
Water levels do not abruptly rise a foot or more during April-June		Water levels are prone to quickly rise at least 1 foot during April-June
A large variety of herbs is present; the site is actively managed to control the spread of non-native or invasive species		Vegetation cover is mostly comprised of one or a few non-native or highly invasive native species
Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, and water		Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
Busy roads are distant from the site		Busy roads border the site
Water quality is excellent		Water is heavily contaminated with pollutants
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.		Surrounding landscape contains no wetlands or ponds
Nest boxes, nest platforms, and other artificial structures intended to assist waterbird nesting are extensive and are regularly maintained.	1	No nest boxes, nest platforms, or other artificial structures intended to assist waterbird nesting are present, or they aren't well-naintained.
Part of the site is visited infrequently in April-June by humans on foot  Areas likely to retain water well into the waterbird breeding see	1	None of the site is visited frequently by numans on foot during April-June

	extensive microtopog absence of outlet cha	traphic !	arration (mand or site is )	ny hummoc	ks, puddles r water stor	. erc.) age.	
Your Judgmen Function Capac			or circl	e one of	f the fol	lowing:	
-	1.0	.8	.6	.4	.2	0	·
	Highest					Lowest	

prevalence of wetland plants (FAC or wetter, and especially OBL)

site is located in flatland terrain (not on slopes)

intensive mortling & gleying of soils throughout most of the seasonally-mundated zone.

Function Capacity (Judgmental Assessment of): Wintering & Migratory Waterbird Support

Wintering & Migratory \ Highest Functioning	Suggested Score:	Minimal Functioning
The site contains extensive surface water during all or most of the fall-winter-spring period		The site contains very little surface water during all or most of the fall-winter-spring period
Water depths in most of the site during most of the fall-winter-spring period are shallow (<24 inches)		If forested, water depths during the fall- winter-spring period are always shallower than 24 inches in all of the site (shallower depths are permissible then in unforested wetlands).
A large portion of the site is inundated only seasonally		Of the water that is present, nearly all is present year-round.
The acreage of various depth categories is about equal during peak annual inundation		A single water depth category predominates.
Microtopographic variation (hummocks, puddles, etc.) is extensive		The substrate is very flat, essentially prohibiting the formation of puddles.
None of the site is visited frequently by humans on foot during September-April.		Water is heavily contaminated with pollutants
A large variety of herbs is present. The site is actively managed to control the spread of non-native or invasive species		Vegetation cover (except in farmed wetlands) is mostly comprised of one or a few non-native or highly invasive native species
Water quality is excellent		Virtually all of the site is visited frequently by humans on foot during April-June
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, agricultural lands, and water		Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
Surrounding landscape contains large acreage of hydric soil, wetlands, and water, including some with a different water regime than the assessed site.		Surrounding landscape contains no wetlands, ponds, or hydric soil.

unction Capacity score =		or circ	e one o	f the fol	lowing:
1.0	8. 0	.6	.4	.2	0
Highest					Lowest

Songbird Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
Some part of the site contains surface water during all (or nearly all) of the year.	12	Surface water is never present at any time of the year.
The site contains a <u>large</u> acreage of closed- canopy forest, native shrubland, wet prairie, and/or emergent wetland.	.2	Acreage of these is very small.
If the site is mostly native shrubland and/or forest, then (a) large-diameter trees are numerous, (b) snags of various sizes are abundant, (c) undercanopy shrub cover is extensive, and (d) a large variety of trees, shrubs and vines is present.	NA	If the site is mostly shrubland and/or forest then (a) trees are very small, (b) snags are absent, (c) under-canopy shrub cover is lacking and (d) the variety of trees, shrubs, and vines is small, and comprised almost entirely of nonnative species.
If the site is mostly wet prairie and/or emergent wetland, then (a) a large variety of herbs is present, (b) the site is actively managed to confrol the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are concentrated in one or a few parts of the site.	.2	If the site is mostly prairie and/or emergent wetland, then (a) the variety of herbs is small, (b) the site is not actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are scattered widely throughout the site.
Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
None of the site is visited frequently by humans on foot	.2	Every part of the site is visited frequently by humans on foot
Busy roads are distant from the site	.2	Busy roads adjoin the site.

Your Judgments:

Function Capacity score = , or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Function Capacity (Judgmental Assessment of):

Support of Characteristic Vegetation

Highest Functioning	Suggested Score:	Minimal Functioning
Trees, shrubs, and herbs are all present, and are well-interspersed throughout the site	1.2	Only one plant form (tree, shrub, herb) is present
If trees are present, many are very old and large, with abundant evidence of regeneration	NA	If trees are present, all are young
If shrubs are present, all of the significantly present shrub species are natives	NA	If shrubs are present, they are comprised of just one species, and it is non-native
If herbs are present, all of the significantly present herb species are natives	.6	If herbs are present, they are comprised of just one species, and it is non-native
Microtopographic relief is great (hummocks, puddles, etc.)	.4	The substrate is very flat, essentially prohibiting the formation of puddles.
Springtime surface water levels drop very slowly (< 2 vertical inches per 30 days, average)	.4	Springtime water levels fluctuate or drop rapidly (>2 inches per 10 days, average)

Highest Functioning	Suggested Score:	Minimal Functioning
None of the site is visited frequently by humans on foot	12	Every part of the site is visited frequently by humans on foot
Busy roads are distant from the site	.2	Busy roads adjoin the site.
I and cover in the contributing watershed is predominantly "natural"	.2	Land cover in the contributing watershed largely contains impervious surface, bare ground lawns, and row crops.
Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	Land cover in surrounding buffer largely contains impervious surface, bare ground, lawns, and row crops.

Your Judgments:
Function Capacity score = , or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Now, summarize your function capacity assessments by recording them on the Assessment Summary Form (p. 59). Be sure to indicate that you used the Judgmental Method.

### Appendix B. Assessment of Function Capacity: Judgmental Method

Complete the following "qualitative assessments" of function only if you chose not to complete the reference-based assessments" that began on page 20.

Instructions: In each row, indicate with a checkmark if your site looks more like the "highest capacity" condition or the "minimal capacity" condition. Then circle a number on the scoring line below this table, based on your overall impression of the site's capacity to support this function. Alternatively, instead of checkmarks, you can assign a score to each row by placing a number in the center column of each row, e.g., 0 (minimal capacity) -to- 1.0 (highest capacity), and then combine the row scores in a manner of your choosing, perhaps weighting some rows more than others if you believe those indicators to have greater influence on a function. Whether based on mathematical operations or another way of synthesizing, be sure to circle your final score for the function on either or both of the shaded "Judgment Lines" at the bottom. Definitions of many of the terms are provided in Appendix A.

Function Capacity (Judgmental Assessment of):

Water Storage and Delay

Highest Functioning	Suggested Score:	Minimal Functioning
The proportion of the site that is inundated only seasonally is large. The seasonally-inundated parts are defined by flood marks on trees and shrubs, stunted plants, and/or distinctive assemblages of plant species.	.6	None of the site is inundated only seasonally The site is always comprised only of permanent water or a high water table without surface water.
Most of the surface water in the seasonally-inundated zone remains for a few days after each rain event, but not less or more.	.4	Water added from rain events empties quickly from all of the site, via outlets or percolation.  This often is evidenced by: lack of flood marks on trees and shrubsscarcity of wetland plants (few FAC or wetter) little or no mottling of soils throughout the seasonally-inundated zonesite is located on slopesite is flat (few or no puddles, etc.)presence of outlet channels

Your Judgments:
Function Capacity score = . or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

~					COLLECT	IL UII.
Codimana	C			-		Retention
seament	Tanin	rotion	and	Diana	U 12 25 25 12	I'N / / ·
THE MALLE WILL	LI CAR KILLE	caulon	allu	FHASIII	TOPHIC	Katantian
					LUX ELD	TECTOTION

Highest Functioning	Suggested Score:	Minimal Functioning
High score was assigned to Water Storage & Delay function (inundation is long, frequent, deep, extensive).	.6	Low score was assigned to Water Storage & Delay function (water levels barely fluctuate).
Texture of the predominant substrate in the upper 12 inches of the seasonal zone is mostly clay, silty clay, sandy clay, clay loam, or native organic. See p. 83 for key to soil textures.	12	Upper 12 inches of the predominant substrate in the seasonal zone is mostly sand or gravel.
Herbs, shrubs, and/or vines together always occupy a large percent of the ground cover in the seasonal zone. Very little soil is bare.	.8	All or nearly all of the substrate in the seasonal zone is unvegetated.
Shallow pools and puddles are present and well-interspersed with herbaceous vegetation	. 8	Shallow pools are absent at all times of the
Substrates have never been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. No evidence of severe erosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. Extensive evidence of severe scour or erosion may be present within the site. No sediment marks on trees or other plants.
Most of the site has complex nicrotopography (hummocks, puddles, etc.)	. 2	The substrate is uniformly flat, with no noticeable microtopography (no hummocks, etc.)

Your Judgments:

unction Capacity score =		or circl	e one of	the fol	lowing:	
1.0	.8	.6	(.4)	.2	0	
Highest					Lowes	t

### Function Capacity (Judgmental Assessment of):

Nitrogen Removal

Highest Functioning	Suggested Score:	The state of the s
	f motiling on	Vor other features that indicate oxygen deficits in
High score was assigned to Water Storage & Delay function (inundation is long, frequent, extensive)	.6	Low score was assigned to Water Storage & Delay function (water levels barely fluctuate)
Some surface water or saturation remains year-round or nearly so, and is dispersed around the site such that water flow paths and residence times are long.	. 2	No surface water or saturation remains year- round. If seasonal flooding occurs, the surface water is concentrated in one part of the site, e.g.,
Soil microbial processes are fairly mature, as possibly suggested by abundance of dead wood, thick and extensive soil organic layer, and many large-diameter trees	.2	channel or pond, and does not remain for long.  Soil microbial processes are not well-developed, as possibly suggested by lack of dead wood, thick soil organic layer, and/or large-diameter trees

Highest Functioning	Suggested Score:	Minimal Functioning
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site. None of the site was constructed from upland.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling.
Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	Most of the site has no noticeable microtopography (no hummocks, puddles, etc.)
Site is burned annually or biennially	.2	Site has not been burned in recent years

Your Judgments:
Function Capacity score = , or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Function Capacity (Judgmental Assessment of): Primary Production

Highest Functioning	Suggested Score:	Minimal Functioning			
All of the site has vascular plants and/or water with algae.	.6	Much of the site is devoid of vascular plants and/or algae.			
A variety of plant forms is present in about equal proportions (trees, shrubs, and herbs) and is well-distributed throughout the site	.2	Whatever plants are present are mainly of a single form (trees, shrubs, or herbs)			
Some shallow (<3 ft) surface water remains year-round or nearly so, and in summer is dispersed around the site, e.g., many puddles	.2	The site is entirely dry during much of the year.			
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling. Severe erosion may be evident within the site.			
The site's contributing watershed contains no cropland, paved surface, buildings, or lawns especially in the parts closest to the site.	.2	The site's contributing watershed is almost entirely cropland, paved surface, buildings, and lawns – especially the parts closest to the site.			

Your Judgments:
Function Capacity score = , or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Thermoregulation

Highest Functioning	Suggested Score:	
- Surface Water during summer I	r riverine sites	at which part of the site is permanently inundated
Entire water surface in summer is shaded by a closed tree canopy or by topography.	12	None of the water is shaded by vegetation or topography, and all of the water is shallower than 2m during summer.
Almost the entire site consists of water deeper than 6 ft.	.2	Very little of the site contains permanent water, and it never is deeper than a few inches.

Your Judgments:
Function Capacity score = . or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Function Capacity (Judgmental Assessment of):

Resident Fish Habitat Support (NA)

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function may be assessed only if par Impounding.	t of the site is	permanently inundated and the subclass is Riverine
Permanent water is extensive, and the site is connected only briefly with associated channels		Permanent water is very limited
Non-native fish species are absent		Non-native species dominate the resident fish component, although some natives are present
Shallow water area and proportion of the site that is inundated only seasonally is of sufficient extent and quality to support spawning by most species, and supports high densities of aquatic invertebrates		If present, shorelines are steep, dropping sharply into water deeper than 6 ft., with little or no seasonal zone being present
Cover (aquatic plants, logs, boulders, overhanging frees, deep water spots, etc.) that provides year-round shelter from predation is abundant		Where water is present seasonally, cover that could shelter fish from predation is scarce or lacking.
Water quality (especially dissolved oxygen) is excellent		Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Your Judgments:
Function Capacity score = . or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Anadromous Fish Habitat Support (NA)

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only inundation	if part of the	site is accessible to anadromous fish during seasonal
Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth		Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth
Floodwaters remain in the site for more than a few days		No surface water remains in the site for more than a few days
Non-native fish species are generally absent		Non-native fish species predominate
Substrates suitable for spawning or feeding are extensively present		Substrates suitable for spawning or feeding are scarce or absent
Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from currents and predators is abundant, at least in the seasonal zone		Cover that provides shelter from currents and predators is scarce or lacking from all parts of the site
Water quality (especially dissolved oxygen) is excellent		Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
Summertime temperature maxima do not exceed preferred range of anadromous fish		Summertime temperature maxima exceed limits lethal to anadromous fish

Your Judgments:

Function Capacity score =	7	or circle	e one of	f the fol	lowing:	
1.0	.8	.6	.4	.2	0	
Highest					Lowest	

Function Capacity (Judgmental Assessment of):

Invertebrate Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
Surface water is permanent or nearly permanent. AND all of the water is shallower than 2 feet during May-September*	12	Surface water is present only briefly (RI sites or not at all (SF sites), OR nearly all of the water remains deeper than 6 ft during May-September
Cover (especially aquatic plants, woody debris) that supports algae and provides shelter from currents and predators is abundant in both the seasonal and permanent zone	. 2	Cover (aquatic plants, woody debris.) that could support algae and provide shelter from currents and predators is lacking
Plant forms and species are highly diverse	.2	Only one plant form is present, and plant species richness is very low
Vegetation is well-interspersed with pools	.4	Vegetation and pools (if any) are in 2 separate areas or zones
Water quality (especially dissolved oxygen) is excellent	.2	Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Highest Functioning	Suggested Score:	Minimal Functioning
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the site was entirely constructed from upland.
Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.	.2	Surrounding landscape contains no wetlands or ponds

 etain water well into the growing season may have many of these characteristics
provarcate of wettand plants (FAC of wetter and economists CDI)
intensive morting & gleying of soils throughout most of the seasonally-inundated zone site is located in flatland terrain (not on slopes)
site is large relative to its contributing watershed (>10) of total areas
extensive microtopographic variation (many hummocks, puddles, etc.) absence of outlet channels, and/or site is managed for water storage.

unction Capacity score =		or circle	e one o	f the fol	lowing:
1.0	.8	.6	.4	(.2)	0
Highest				(3)	Lowest

Function Capacity (Judgmental Assessment of): Amphibian & Turtle Habitat

Highest Functioning	Suggested Score:	Minimal Functioning
Permanent water is absent, but shallow surface water that contains extensive partly-submerged fine-stemmed herbs¹ is extensive, and recedes very gradually during the months of January – May ² (i.e., during this period, there are at least 30 days when water levels are stable or have a vertical fluctuation of <2 inches).  OR:  Permanent water is extensive and contains (a) abundant underwater cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from predation, and (b) partly-submerged fine-stemmed herbs¹	. 4	Site never contains surface water  OR  Site is entirely surface water, which either (a) never fluctuates vertically (i.e., no seasonal zone is present), or (b) fluctuates too much – more than 2 inches during all 10-day periods, or (c) is devoid of any emergent herbs that are partly- submerged during the springtime, or (d) flows faster than 4 inches/second during the entire springtime, everywhere in the site, or (e) is mostly deeper than 40 inches and is bordered by a shoreline with a very steep slope
Bullfrogs and other non-native predators are absent	0	Bullfrogs and other non-native predators are abundant
If surface water everywhere in the site is flowing during springtime, there are at least 30 days when current velocities are slow (<4 inches/second)	.4	If surface water everywhere in the site is flowing during springtime, there are never more than 30 days when current velocities are slow (<4 inches/second)
There is extensive and varied woody debris in the seasonal zone	0	There is no woody debris in the seasonal zone

Highest Functioning	Suggested Score:	Minimal Functioning
Either vegetation and pools are well- interspersed during high water level, or any woody vegetation bordering the larger pools is located mostly on their north end. <sup>3</sup> Microtopography is quite varied.	.2	Vegetation and pools are in separate areas of the site during high water level, and any woody vegetation bordering the larger pools is located mostly on their south end. Microtopography is too flat to allow many puddles to form (no hummocks, etc.)
Suitable basking sites for turtles and calling sites for frogs are present	. 2	There are no basking sites for turtles or calling sites for frogs
Land cover in adjoining uplands is a mix of natural grassland and woodland; woodlands have extensive and varied woody debris	.2	Land cover in adjoining uplands largely contains impervious surface, bare ground, lawns, and row crops
Shorelines are gently sloping	.4	Shorelines, if present, are mostly steep
Busy roads are distant from the site	.2	Busy roads adjoin the site
Many other wetlands (excluding flowing water) are present nearby	.2	There are no other wetlands (excluding flowing water) nearby
Water quality is excellent	.2	Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe crosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the entire site was constructed from upland.
Soils and submerged sediments contain a moderately thick organic layer (leaf litter, peat, decomposed organics, etc.)  Emergent herbs with stem diameter of <3 mm (measured 2 inch		Soils and submerged sediments contain no organic layer, and are mostly hard-packed clay; or organic layer is so thick that water is chronically anoxic.

with stem diameter of <3 mm (measured 2 inches below springtime water surface); this includes nearly all perennial herbs except cattail.

Areas likely to retain water well into the growing se

 which will the growing season may have many of these characteristics	
prevalence of wetland plants (FAC or wetter, and especially OBL)	-
intensive mottling & gleying of soils throughout most of the seasonally-inundated zone site is located in flatland terrain (not on slopes)	
extensive microtopographic variation (many hummocks, puddles, etc.) absence of outlet channels, and/or site is managed for more devices.	

During the January-May period, 30 days of stable water levels are required for some aquatic amphibian eggs to mature, and during this time fluctuations of greater than 2 inches are lethal (Richter 1997).

\*Vegetation located north of pools is less likely to block sunlight important to developing aquatic amphibians (Richter 1997).

Function Capacity score =		or circl	e one o	f the fol	lowing:
1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Breeding Waterbird Support (NA) Airport

Highest Functioning	Suggested Score:	Minimal Functioning
The site contains many acres of permanent or nearly permanent surface water, or a large permanent wetland (excluding streams) is located nearby		Surface water is present for only a few weeks during April-June, ORNearly all of the water remains deeper than 6 ft during May-September
AND Water depths are predominantly shallow (2 to 24 inches) in April-August*		AND  No permanent wetlands are located nearby.
Most of the shoreline is not steep		Most of the shoreline is steep
Larger pools of water are bordered by a wide, dense band of tall herbs and/or shrubs in April-August.		Larger pools, if present, are bordered by only a narrow band of sparse vegetation
About equal proportions of water and vegetation are present, and are well-interspersed during the April – August period		Vegetation and pools (if any) are in 2 separate areas or zones, not interspersed
Water levels do not abruptly rise a foot or more during April-June		Water levels are prone to quickly rise at least 1 foot during April-June
A large variety of herbs is present; the site is actively managed to control the spread of non-native or invasive species	The state of the s	Vegetation cover is mostly comprised of one or a few non-native or highly invasive native species
Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, and water		Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
Busy roads are distant from the site		Busy roads border the site
Water quality is excellent		Water is heavily contaminated with pollutants
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.		Surrounding landscape contains no wetlands or ponds
Nest boxes, nest platforms, and other artificial structures intended to assist waterbird nesting are extensive and are regularly maintained.	1	No nest boxes, nest platforms, or other artificial structures intended to assist waterbird nesting are present, or they aren't well-naintained.
Part of the site is visited infrequently in April-June by humans on foot	Ĭ	None of the site is visited frequently by

prevalence of wetland plants (FAC or wetter, and especially OBL)     intensive mottling & gleying of soils throughout most of the seasonally-inundated zone site is located in flatland terrain (not on slopes)
extensive microtopographic variation (many hummocks, puddles, etc.) absence of outlet channels, and/or site is managed for water storage.

\* Areas likely to retain water well into the waterbird breeding season may have many of these characteristics:

Function Capacity score = , or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Function Capacity (Judgmental Assessment of):
Wintering & Migratory Waterbird Support / NA

Highest Functioning	Suggested Score:	Minimal Functioning		
The site contains extensive surface water during all or most of the fall-winter-spring period		The site contains very little surface water during all or most of the fall-winter-spring period		
Water depths in most of the site during most of the fall-winter-spring period are shallow (<24 inches)		If forested, water depths during the fall- winter-spring period are always shallower than 24 inches in all of the site (shallower depths are permissible then in unforested wetlands).		
A large portion of the site is inundated only seasonally		Of the water that is present, nearly all is present year-round.		
The acreage of various depth categories is about equal during peak annual inundation		A single water depth category predominates.		
Microtopographic variation (hummocks, puddles, etc.) is extensive		The substrate is very flat, essentially prohibiting the formation of puddles.		
None of the site is visited frequently by humans on foot during September-April.		Water is heavily contaminated with pollutants		
A large variety of herbs is present. The site is actively managed to control the spread of non-native or invasive species		Vegetation cover (except in farmed wetlands) is mostly comprised of one or a few non-native or highly invasive native species		
Water quality is excellent		Virtually all of the site is visited frequently by humans on foot during April-June		
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)		
Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, agricultural lands, and water		Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.		
Surrounding landscape contains large acreage of hydric soil, wetlands, and water, including some with a different water regime han the assessed site.		Surrounding landscape contains no wetlands, ponds, or hydric soil.		

Cour Judgments:  Function Capacity score =		or circl	e one or	the fol	lowing:	
1.0	.8	.6	.4	.2	0	
Highest					Lowest	

Songbird Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning			
Some part of the site contains surface water during all (or nearly all) of the year.	12	Surface water is never present at any time of the year.			
The site contains a <u>large</u> acreage of closed- canopy forest, native shrubland, wet prairie, and/or emergent wetland.	2	Acreage of these is very small.			
If the site is mostly native shrubland and/or forest, then (a) large-diameter trees are numerous, (b) snags of various sizes are abundant, (c) undercanopy shrub cover is extensive, and (d) a large variety of trees, shrubs and vines is present.	NA	If the site is mostly shrubland and/or forest, then (a) trees are very small, (b) snags are absent, (c) under-canopy shrub cover is lacking, and (d) the variety of trees, shrubs, and vines is small, and comprised almost entirely of non-native species.			
If the site is mostly wet prairie and/or emergent wetland, then (a) a large variety of herbs is present, (b) the site is actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are concentrated in one or a few parts of the site.	.2	If the site is mostly prairie and/or emergent wetland, then (a) the variety of herbs is small, (b) the site is not actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are scattered widely throughout the site.			
Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.			
None of the site is visited frequently by numans on foot	12	Every part of the site is visited frequently by humans on foot			
Busy roads are distant from the site	.2	Busy roads adjoin the site.			

Your Judgments:

function Capacity score =		_,	or circl	e one o	the fol	lowing:
1	.0	.8	.6	.4	(.2)	n
Highest		-		272	9	Lowest

Function Capacity (Judgmental Assessment of):

Support of Characteristic Vegetation

Highest Functioning	Suggested Score:	Minimal Functioning		
Trees, shrubs, and herbs are all present, and are well-interspersed throughout the site	12	Only one plant form (tree, shrub, herb) is present		
If trees are present, many are very old and large, with abundant evidence of regeneration	NA	If trees are present, all are young		
If shrubs are present, all of the significantly present shrub species are natives	NA	If shrubs are present, they are comprised of just one species, and it is non-native		
If herbs are present, all of the significantly present herb species are natives	.4	If herbs are present, they are comprised of just one species, and it is non-native		
Microtopographic relief is great (hummocks, puddles, etc.)	.4	The substrate is very flat, essentially prohibiting the formation of puddles.		
Springtime surface water levels drop very slowly (< 2 vertical inches per 30 days, average)	.4	Springtime water levels fluctuate or drop rapidly (>2 inches per 10 days, average)		

Highest Functioning	Suggested Score:	Minimal Functioning		
None of the site is visited frequently by humans on foot	12	Every part of the site is visited frequently by humans on foot		
Busy roads are distant from the site	.2	Busy roads adjoin the site.		
I and cover in the contributing watershed is predominantly "natural"	12	Land cover in the contributing watershed largely contains impervious surface, bare ground lawns, and row crops.		
Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	Land cover in surrounding buffer largely contains impervious surface, bare ground, lawns, and row crops.		

Now, summarize your function capacity assessments by recording them on the Assessment Summary Form (p. 59). Be sure to indicate that you used the Judgmental Method.

### Appendix B. Assessment of Function Capacity: Judgmental Method

Complete the following "qualitative assessments" of function only if you chose not to complete the reference-based assessments" that began on page 20.

Instructions: In each row, indicate with a checkmark if your site looks more like the "highest capacity" condition or the "minimal capacity" condition. Then circle a number on the scoring line below this table, based on your overall impression of the site's capacity to support this function. Alternatively, instead of checkmarks, you can assign a score to each row by placing a number in the center column of each row, e.g., 0 (minimal capacity) -to- 1.0 (highest capacity), and then combine the row scores in a manner of your choosing, perhaps weighting some rows more than others if you believe those indicators to have greater influence on a function. Whether based on mathematical operations or another way of synthesizing, be sure to circle your final score for the function on either or both of the shaded "Judgment Lines" at the bottom. Definitions of many of the terms are provided in Appendix A.

Function Capacity (Judgmental Assessment of):

Water Storage and Delay

Highest Functioning	Suggested Score:	Minimal Functioning
The proportion of the site that is inundated only seasonally is large. The seasonally-inundated parts are defined by flood marks on trees and shrubs, stunted plants, and/or distinctive assemblages of plant species.	.4	None of the site is inundated only seasonally. The site is always comprised only of permanent water or a high water table without surface water.
Most of the surface water in the seasonally- inundated zone remains for a few days after each rain event, but not less or more.	. 2	Water added from rain events empties quickly from all of the site, via outlets or percolation.  This often is evidenced by: lack of flood marks on trees and shrubsscarcity of wetland plants (few FAC or wetter) little or no mottling of soils throughout the seasonally-inundated zonesite is located on slopesite is flat (few or no puddles, etc.)presence of outlet channels

Your Judgments: Function Capacity score =	*	or circl	e one o	f the fol	lowing:	
1.0	.8	.6	.4	(.2)	0	
Highest					Lowest	

Function Capacity (Judgmental Assessment of): Sediment Stabilization and Phosphorus Retention

Highest Functioning	Suggested Score:	
High score was assigned to Water Storage & Delay function (inundation is long, frequent, deep, extensive).	.4	Low score was assigned to Water Storage & Delay function (water levels barely fluctuate).
Texture of the predominant substrate in the upper 12 inches of the seasonal zone is mostly clay, silty clay, sandy clay, clay loam, or native organic. See p. 83 for key to soil textures.	.2	Upper 12 inches of the predominant substrate in the seasonal zone is mostly sand or gravel.
Herbs, shrubs, and/or vines together always occupy a large percent of the ground cover in the seasonal zone. Very little soil is bare.	.2	All or nearly all of the substrate in the seasonal zone is unvegetated.
Shallow pools and puddles are present and well-interspersed with herbaceous vegetation	.8	Shallow pools are absent at all times of the year
Substrates have never been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. No evidence of severe erosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. Extensive evidence of severe scour or erosion may be present within the site. No sediment marks on trees or other plants.
Most of the site has complex nicrotopography (hummocks, puddles, etc.)	.2	The substrate is uniformly flat, with no noticeable microtopography (no hummocks, etc.)

unction Capacity score	/ Continue /	,	or circl	e one o	f the fol	lowing:	
	1.0	.8	.6	.4	(2)	0	
Hi	ghest				0	Lowesi	

Function Capacity (Judgmental Assessment of):

Nitrogen Removal

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only i soils/ sediments are found in at least part of the si	(motiling and	Vor other features that indicate oxygen deficits in
High score was assigned to Water Storage & Delay function (inundation is long, frequent, extensive)	.4	Low score was assigned to Water Storage & Delay function (water levels barely fluctuate)
Some surface water or saturation remains year-round or nearly so, and is dispersed around the site such that water flow paths and residence times are long.	.2	No surface water or saturation remains year- round. If seasonal flooding occurs, the surface water is concentrated in one part of the site, e.g.,
Soil microbial processes are fairly mature, as possibly suggested by abundance of dead wood, thick and extensive soil organic layer, and many large-diameter trees	.2	channel or pond, and does not remain for long.  Soil microbial processes are not well-developed, as possibly suggested by lack of dead wood, thick soil organic layer, and/or large-diameter trees

Highest Functioning	Suggested Score:	Minimal Functioning
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site. None of the site was constructed from upland.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling.
Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	Most of the site has no noticeable microtopography (no hummocks, puddles, etc.)
Site is burned annually or biennially	.2	Site has not been burned in recent years

Your Judgments:
Function Capacity score = , or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Function Capacity (Judgmental Assessment of):

**Primary Production** 

Highest Functioning	Suggested Score:	Minimal Functioning
All of the site has vascular plants and/or water with algae.	.4	Much of the site is devoid of vascular plants and/or algae.
A variety of plant forms is present in about equal proportions (trees, shrubs, and herbs) and is well-distributed throughout the site	.2	Whatever plants are present are mainly of a single form (trees, shrubs, or herbs)
Some shallow (<3 ft) surface water remains year-round or nearly so, and in summer is dispersed around the site, e.g., many puddles	.2	The site is entirely dry during much of the year.
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	. 2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling. Severe erosion may be evident within the site.
The site's contributing watershed contains no cropland, paved surface, buildings, or lawns especially in the parts closest to the site.	.2	The site's contributing watershed is almost entirely cropland, paved surface, buildings, and lawns – especially the parts closest to the site.

Your Judgments:
Function Capacity score = , or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Thermoregulation

Highest Functioning	Suggested Score:	
and connected by surface water during summer i	r riverine sites	at which part of the site is permanently inundated bodies.
Entire water surface in summer is shaded by a closed tree canopy or by topography.	.2	None of the water is shaded by vegetation or topography, and all of the water is shallower than 2m during summer.
Almost the entire site consists of water deeper than 6 ft.	.2	Very little of the site contains permanent water, and it never is deeper than a few inches.

Your Judgments:

Function Capacity score =	*	or circl	e one o	f the fol	lowing:
1.0	.8	.6	.4	(.2)	0
Highest		N. C.			Lowest

Function Capacity (Judgmental Assessment of):

Resident Fish Habitat Support NA

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function may be assessed only if par Impounding.	t of the site is	permanently inundated and the subclass is Riverine
Permanent water is extensive, and the site is connected only briefly with associated channels		Permanent water is very limited
Non-native fish species are absent		Non-native species dominate the resident fish component, although some natives are present
Shallow water area and proportion of the site that is inundated only seasonally is of sufficient extent and quality to support spawning by most species, and supports high densities of aquatic invertebrates		If present, shorelines are steep, dropping sharply into water deeper than 6 ft., with little or no seasonal zone being present
Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides year-round shelter from predation is abundant		Where water is present seasonally, cover that could shelter fish from predation is scarce or lacking.
Water quality (especially dissolved oxygen) is excellent		Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Your Judgments:

Anadromous Fish Habitat Support NA

Highest Functioning	Suggested Score:	Minimal Functioning
<u>Note</u> : Proceed with assessing this function only inundation	if part of the	site is accessible to anadromous fish during seasonal
Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth		Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth
Floodwaters remain in the site for more than a few days		No surface water remains in the site for more than a few days
Non-native fish species are generally absent		Non-native fish species predominate
Substrates suitable for spawning or feeding are extensively present	+	Substrates suitable for spawning or feeding are scarce or absent
Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from currents and predators is abundant, at least in the seasonal zone		Cover that provides shelter from currents and predators is scarce or lacking from all parts of the site
Water quality (especially dissolved oxygen) is excellent		Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
Summertime temperature maxima do not exceed preferred range of anadromous fish		Summertime temperature maxima exceed limits lethal to anadromous fish

Your Judgments:

Function Capacity score =			or circle	e one of	the fol	lowing:	
1	.0	.8	.6	.4	.2	0	
Highest						Lowest	

Function Capacity (Judgmental Assessment of):

Invertebrate Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
Surface water is permanent or nearly permanent, AND all of the water is shallower than 2 feet during May-September*	.2	Surface water is present only briefly (RI sites) or not at all (SF sites), OR nearly all of the water remains deeper than 6 ft during May-September
Cover (especially aquatic plants, woody debris) that supports algae and provides shelter from currents and predators is abundant in both the seasonal and permanent zone	.2	Cover (aquatic plants, woody debris.) that could support algae and provide shelter from currents and predators is lacking
Plant forms and species are highly diverse	.2	Only one plant form is present, and plant species richness is very low
Vegetation is well-interspersed with pools	. 4	Vegetation and pools (if any) are in 2 separate areas or zones
Water quality (especially dissolved oxygen) is excellent	.2	Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Highest Functioning	Suggested Score:	Minimal Functioning
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the site was entirely constructed from upland.
Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.	.2	Surrounding landscape contains no wetlands or ponds

\* Areas likely to retain water well into the growing season may have many of these characteristics:

Process	grand may have many in these characteristics
-	prevalence of wetland plants (FAC or wetter, and especially OBL)
-	intensive mortiling & gleying of soils throughout most of the sensonally-inundated zone site is located in flatland terrain (not on slopes)
-	site is large relative to its contributing watershed (>4% of total area)
-	extensive microtopographic variation (many hummocks, puddles, etc.) absence of outlet channels, and/or site is managed for water storage

Your Judgments:

function Capacity score =	Notific approximation	A)	or circle	e one o	f the fol	lowing:	
1	.0	.8	.6	.4	(.2)	0	
Highest						Lowest	

### Function Capacity (Judgmental Assessment of):

Amphibian & Turtle Habitat

Highest Functioning	Suggested Score:	Minimal Functioning
Permanent water is absent, but shallow surface water that contains extensive partly-submerged fine-stemmed herbs¹ is extensive, and recedes very gradually during the months of January – May ² (i.e., during this period, there are at least 30 days when water levels are stable or have a vertical fluctuation of <2 inches).  OR:  Permanent water is extensive and contains (a) abundant underwater cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from predation, and (b) partly-submerged fine-stemmed herbs¹	• 2	Site never contains surface water  OR  Site is entirely surface water, which either (a) never fluctuates vertically (i.e., no seasonal zone is present), or (b) fluctuates too much – more than 2 inches during all 10-day periods, or (c) is devoid of any emergent herbs that are partly- submerged during the springtime, or (d) flows faster than 4 inches/second during the entire springtime, everywhere in the site, or (e) is mostly deeper than 40 inches and is bordered by a shoreline with a very steep slope
Bullfrogs and other non-native predators absent		Bullfrogs and other non-native predators are abundant
If surface water everywhere in the site is lowing during springtime, there are at least 30 lays when current velocities are slow (<4 nches/second)	.2	If surface water everywhere in the site is flowing during springtime, there are never more than 30 days when current velocities are slow (<4 inches/second)
There is extensive and varied woody lebris in the seasonal zone	0	There is no woody debris in the seasonal zone

Highest Functioning	Suggested Score:	Minimal Functioning
Either vegetation and pools are well- interspersed during high water level, or any woody vegetation bordering the larger pools is located mostly on their north end. <sup>3</sup> Microtopography is quite varied.	.2	Vegetation and pools are in separate areas of the site during high water level, and any woody vegetation bordering the larger pools is located mostly on their south end. Microtopography is too flat to allow many puddles to form (no hummocks, etc.)
Suitable basking sites for turtles and calling sites for frogs are present	12	There are no basking sites for turtles or calling sites for frogs
Land cover in adjoining uplands is a mix of natural grassland and woodland; woodlands have extensive and varied woody debris	.2	Land cover in adjoining uplands largely contains impervious surface, bare ground, lawns, and row crops
Shorelines are gently sloping	.2	Shorelines, if present, are mostly steep
Busy roads are distant from the site	12	Busy roads adjoin the site
Many other wetlands (excluding flowing water) are present nearby	.2	There are no other wetlands (excluding flowing water) nearby
Water quality is excellent	.2	Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the entire site was constructed from upland.
Soils and submerged sediments contain a moderately thick organic layer (leaf litter, peat, decomposed organics, etc.)	12	Soils and submerged sediments contain no organic layer, and are mostly hard-packed clay; or organic layer is so thick that water is chronically anoxic.

Emergent herbs with stem diameter of <3 mm (measured 2 inches below springtime water surface); this includes nearly all perennial herbs except cattail.

Areas likely to retain water well into the growing season may have many of these characteristics.

prevalence of wetland plants (FAC or wetter, and especially OBL.) intensive mottling & gleying of soils throughout most of the seasonally-inundated zone site is located in flatland terrain (not on slopes)

extensive microtopographic variation (many hummocks, puddles, etc.)
absence of outlet channels, and/or site is managed for water storage.

During the January-May period, 30 days of stable water levels are required for some aquatic amphibian eggs to mature, and during this time fluctuations of greater than 2 inches are lethal (Richter 1997).

Vegetation located north of pools is less likely to block sunlight important to developing aquatic amphibians (Richter 1997).

Your	Jud	gments	5
	minimum minimum and a second		z,

Function Capacity score =	***************************************	or circl	e one o	f the fol	lowing:	
1.0	8.	.6	.4	(.2)	0	
Highest					Lowest	

Function Capacity (Judgmental Assessment of):
Breeding Waterbird Support (NA) in Airput

Highest Functioning	Suggested Score:	Minimal Functioning
The site contains many acres of permanent or nearly permanent surface water, or a large permanent wetland (excluding streams) is located nearby  AND		Surface water is present for only a few weeks during April-June, OR  Nearly all of the water remains deeper than 6 ft during May-September  AND
Water depths are predominantly shallow (2 to 24 inches) in April-August*		No permanent wetlands are located nearby.
Most of the shoreline is not steep	2	Most of the shoreline is steep
Larger pools of water are bordered by a wide, dense band of tall herbs and/or shrubs in April-August.		Larger pools, if present, are bordered by only a narrow band of sparse vegetation
About equal proportions of water and vegetation are present, and are well-interspersed during the April – August period		Vegetation and pools (if any) are in 2 separate areas or zones, not interspersed
Water levels do not abruptly rise a foot or more during April-June		Water levels are prone to quickly rise at least 1 foot during April-June
A large variety of herbs is present; the site is actively managed to control the spread of non-native or invasive species		Vegetation cover is mostly comprised of one or a few non-native or highly invasive native species
Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, and water		Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
Busy roads are distant from the site		Busy roads border the site
Water quality is excellent		Water is heavily contaminated with pollutants
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.		Surrounding landscape contains no wetlands or ponds
Nest boxes, nest platforms, and other rtificial structures intended to assist waterbird esting are extensive and are regularly naintained.	1	No nest boxes, nest platforms, or other artificial structures intended to assist waterbird nesting are present, or they aren't well-maintained.
Part of the site is visited infrequently in pril-June by humans on foot	l j	None of the site is visited frequently by numans on foot during April-June

prevalence of wetland plants (FAC or wetter, and especially OBL) intensive mottling & gleying of soils throughout most of the seasonally-inundated zone site is located in flatland terrain (not on slopes)
extensive microtopographic variation (many hummocks, puddles, etc.) absence of outlet channels, and/or site is managed for water storage.

Your Judgments: Function Capacity score =		or circl	e one of	f the fol	lowing:	
1.0	.8	.6	.4	.2	0	
Highest					Lowest	

Function Capacity (Judgmental Assessment of):
Wintering & Migratory Waterbird Support (NA) in Air Port

Highest Functioning	Suggested Score:	Minimal Functioning
The site contains extensive surface water during all or most of the fall-winter-spring period		The site contains very little surface water during all or most of the fall-winter-spring period
Water depths in most of the site during most of the fall-winter-spring period are shallow (<24 inches)		If forested, water depths during the fall- winter-spring period are always shallower than 24 inches in all of the site (shallower depths are permissible then in unforested wetlands).
A large portion of the site is inundated only seasonally		Of the water that is present, nearly all is present year-round.
The acreage of various depth categories is about equal during peak annual inundation		A single water depth category predominates.
Microtopographic variation (hummocks, puddles, etc.) is extensive		The substrate is very flat, essentially prohibiting the formation of puddles.
None of the site is visited frequently by humans on foot during September-April.		Water is heavily contaminated with pollutants
A large variety of herbs is present. The site is actively managed to control the spread of non-native or invasive species		Vegetation cover (except in farmed wetlands) is mostly comprised of one or a few non-native or highly invasive native species
Water quality is excellent		Virtually all of the site is visited frequently by humans on foot during April-June
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)

Land cover in surrounding buffer zones

largely contains impervious surface, bare ground,

Surrounding landscape contains no wetlands,

lawns, and row crops.

ponds, or hydric soil.

# Your Judgments: Function Capacity score = . or circle one of the following: 1.0 .8 .6 .4 .2 0 Highest Lowest

Land cover in surrounding buffer zones is

mainly a mix of natural grassland, woodland.

Surrounding landscape contains large

acreage of hydric soil, wetlands, and water,

including some with a different water regime

agricultural lands, and water

than the assessed site.

Songbird Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
Some part of the site contains surface water during all (or nearly all) of the year.	.2	Surface water is never present at any time of the year.
The site contains a <u>large</u> acreage of closed-canopy forest, native shrubland, wet prairie, and/or emergent wetland.	. , 2	Acreage of these is very small.
If the site is mostly native shrubland and/or forest, then (a) large-diameter trees are numerous, (b) snags of various sizes are abundant, (c) undercanopy shrub cover is extensive, and (d) a large variety of trees, shrubs and vines is present.	NA	If the site is mostly shrubland and/or forest. then (a) trees are very small, (b) snags are absent, (c) under-canopy shrub cover is lacking and (d) the variety of trees, shrubs, and vines is small, and comprised almost entirely of non-native species.
If the site is mostly wet prairie and/or emergent wetland, then (a) a large variety of herbs is present, (b) the site is actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are concentrated in one or a few parts of the site.	.2	If the site is mostly prairie and/or emergent wetland, then (a) the variety of herbs is small, (b) the site is not actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are scattered widely throughout the site.
Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
None of the site is visited frequently by numans on foot	.2	Every part of the site is visited frequently by humans on foot
Busy roads are distant from the site	. 2	Busy roads adjoin the site.

Your Judgments:

Function Capacity score =		or circl	e one o	f the fol	lowing:
1.0	.8	.6	.4	(2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):

Support of Characteristic Vegetation

Highest Functioning	Suggested Score:	Minimal Functioning
Trees, shrubs, and herbs are all present, and are well-interspersed throughout the site	.2	Only one plant form (tree, shrub, herb) is present
If trees are present, many are very old and large, with abundant evidence of regeneration	NA	If trees are present, all are young
If shrubs are present, all of the significantly present shrub species are natives	AH	If shrubs are present, they are comprised of just one species, and it is non-native
If herbs are present, all of the significantly present herb species are natives	. 4	If herbs are present, they are comprised of just one species, and it is non-native
Microtopographic relief is great hummocks, puddles, etc.)	. 4	The substrate is very flat, essentially prohibiting the formation of puddles.
Springtime surface water levels drop very slowly (< 2 vertical inches per 30 days, werage)	.2	Springtime water levels fluctuate or drop rapidly (>2 inches per 10 days, average)

Highest Functioning	Suggested Score:	Minimal Functioning
None of the site is visited frequently by humans on foot	12	Every part of the site is visited frequently by humans on foot
Busy roads are distant from the site	12	Busy roads adjoin the site.
Land cover in the contributing watershed is predominantly "natural"	.2	Land cover in the contributing watershed largely contains impervious surface, bare ground lawns, and row crops.
Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	Land cover in surrounding buffer largely contains impervious surface, bare ground, lawns, and row crops.

Your Judgments:
Function Capacity score = , or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Now, summarize your function capacity assessments by recording them on the Assessment Summary Form (p. 59). Be sure to indicate that you used the Judgmental Method.

## Appendix B. Assessment of Function Capacity: Judgmental Method

Complete the following "qualitative assessments" of function only if you chose not to complete the reference-based assessments" that began on page 20.

Instructions: In each row, indicate with a checkmark if your site looks more like the "highest capacity" condition or the "minimal capacity" condition. Then circle a number on the scoring line below this table, based on your overall impression of the site's capacity to support this function. Alternatively, instead of checkmarks, you can assign a score to each row by placing a number in the center column of each row, e.g., 0 (minimal capacity) -to- 1.0 (highest capacity), and then combine the row scores in a manner of your choosing, perhaps weighting some rows more than others if you believe those indicators to have greater influence on a function. Whether based on mathematical operations or another way of synthesizing, be sure to circle your final score for the function on either or both of the shaded "Judgment Lines" at the bottom. Definitions of many of the terms are provided in Appendix A.

Function Capacity (Judgmental Assessment of):

Water Storage and Delay

Highest Functioning	Suggested Score:	Minimal Functioning
The proportion of the site that is inundated only seasonally is large. The seasonally-inundated parts are defined by flood marks on trees and shrubs, stunted plants, and/or distinctive assemblages of plant species.	.4	None of the site is inundated only seasonally The site is always comprised only of permanent water or a high water table without surface water.
Most of the surface water in the seasonally-inundated zone remains for a few days after each rain event, but not less or more.	,4	Water added from rain events empties quick! from all of the site, via outlets or percolation.  This often is evidenced by: lack of flood marks on trees and shrubsscarcity of wetland plants (few FAC or wetter)little or no mottling of soils throughout the seasonally-inundated zonesite is located on slopesite is flat (few or no puddles, etc.)presence of outlet channels

Your Judgments:
Function Capacity score = . or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Function Capacity (Judgmental Assessment of): Sediment Stabilization and Phosphorus Retention

Highest Functioning	Suggested Score:	Minimal Functioning
High score was assigned to Water Storage & Delay function (inundation is long, frequent deep, extensive).	.4	Low score was assigned to Water Storage & Delay function (water levels barely fluctuate).
Texture of the predominant substrate in the upper 12 inches of the seasonal zone is mostly clay, silty clay, sandy clay, clay loam, or native organic. See p. 83 for key to soil textures.	.6	Upper 12 inches of the predominant substrate in the seasonal zone is mostly sand or gravel.
Herbs, shrubs, and/or vines together always occupy a large percent of the ground cover in the seasonal zone. Very little soil is bare.	. 6	All or nearly all of the substrate in the seasonal zone is unvegetated.
Shallow pools and puddles are present and well-interspersed with herbaceous vegetation	.6	Shallow pools are absent at all times of the year
Substrates have never been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. No evidence of severe erosion within the site.	.4	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. Extensive evidence of severe scour or erosion may be present within the site. No sediment marks on trees or other plants.
Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	The substrate is uniformly flat, with no noticeable microtopography (no hummocks, etc.)

Your Judgments: Function Capacity score =		or circ	e one o	f the fol	lowing:	
1.0 Highest	.8	.6	(4)	.2	0 Lowest	

## Function Capacity (Judgmental Assessment of):

Nitrogen Removal

Highest Functioning	Suggested Score:	
	funatilina	I/or other features that indicate oxygen deficits in
High score was assigned to Water Storage & Delay function (inundation is long, frequent, extensive)	.4	Low score was assigned to Water Storage & Delay function (water levels barely fluctuate)
Some surface water or saturation remains year-round or nearly so, and is dispersed around the site such that water flow paths and residence times are long.	.2	No surface water or saturation remains year- round. If seasonal flooding occurs, the surface water is concentrated in one part of the site, e.g.,
Soil microbial processes are fairly mature, as possibly suggested by abundance of dead wood, thick and extensive soil organic layer, and many large-diameter trees	.6	channel or pond, and does not remain for long.  Soil microbial processes are not well-developed, as possibly suggested by lack of dead wood, thick soil organic layer, and/or large-diameter trees

Highest Functioning	Suggested Score:	Minimal Functioning
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site. None of the site was constructed from upland.	,4	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling.
Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	Most of the site has no noticeable microtopography (no hummocks, puddles, etc.)
Site is burned annually or biennially	12	Site has not been burned in recent years

Your Judgments:
Function Capacity score = , or circle one of the following:

1.0 .8 .6 (.4) .2 0

Highest Lowest

Function Capacity (Judgmental Assessment of):

**Primary Production** 

Highest Functioning	Suggested Score:	Minimal Functioning
All of the site has vascular plants and/or water with algae.	.4	Much of the site is devoid of vascular plants and/or algae.
A variety of plant forms is present in about equal proportions (trees, shrubs, and herbs) and is well-distributed throughout the site	12	Whatever plants are present are mainly of a single form (trees, shrubs, or herbs)
Some shallow (<3 ft) surface water remains year-round or nearly so, and in summer is dispersed around the site, e.g., many puddles	.2	The site is entirely dry during much of the year.
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	,4	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling. Severe erosion may be evident within the site.
The site's contributing watershed contains no cropland, paved surface, buildings, or lawns especially in the parts closest to the site.	.2	The site's contributing watershed is almost entirely cropland, paved surface, buildings, and lawns – especially the parts closest to the site.

Your Judgments:
Function Capacity score = , or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Thermoregulation

Highest Functioning	Suggested Score:	The state of the s
and connected by surface water during summer i	r riverine sites to other water	at which part of the site is permanently inundated
Entire water surface in summer is shaded by a closed tree canopy or by topography.	.2	None of the water is shaded by vegetation or topography, and all of the water is shallower than 2m during summer.
Almost the entire site consists of water deeper than 6 ft.	.2	Very little of the site contains permanent water, and it never is deeper than a few inches.

Your Judgments:

metion Capacity se	ore =	5	or circle	e one of	the fol	lowing:	
	1.0	.8	.6	.4	(2)	0	
	Highest					Lowest	

Function Capacity (Judgmental Assessment of):

Resident Fish Habitat Support NA

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function may be assessed only if par Impounding.	t of the site is	permanently inundated and the subclass is Riverine
Permanent water is extensive, and the site is connected only briefly with associated channels		Permanent water is very limited
Non-native fish species are absent		Non-native species dominate the resident fish component, although some natives are present
Shallow water area and proportion of the site that is inundated only seasonally is of sufficient extent and quality to support spawning by most species, and supports high densities of aquatic invertebrates		If present, shorelines are steep, dropping sharply into water deeper than 6 ft., with little or no seasonal zone being present
Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides year-round shelter from predation is abundant		Where water is present seasonally, cover that could shelter fish from predation is scarce or lacking.
Water quality (especially dissolved oxygen) is excellent		Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Your Judgments:

Function Capacity score = , or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Anadromous Fish Habitat Support NA

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only inundation	if part of the	site is accessible to anadromous fish during seasona
Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth		Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth
Floodwaters remain in the site for more than a few days		No surface water remains in the site for more than a few days
Non-native fish species are generally absent		Non-native fish species predominate
Substrates suitable for spawning or feeding are extensively present	H H	Substrates suitable for spawning or feeding are scarce or absent
Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from currents and predators is abundant, at least in the seasonal zone		Cover that provides shelter from currents and predators is scarce or lacking from all parts of the site
Water quality (especially dissolved oxygen) is excellent		Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
Summertime temperature maxima do not exceed preferred range of anadromous fish		Summertime temperature maxima exceed limits lethal to anadromous fish

Your Judgments:

Function Capacity score =		7	or circle	e one o	f the fol	lowing:	
1	.0	.8	.6	.4	.2	0	
Highest						Lowest	

Function Capacity (Judgmental Assessment of):

Invertebrate Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
Surface water is permanent or nearly permanent. AND all of the water is shallower than 2 feet during May-September*	.6	Surface water is present only briefly (RI sites or not at all (SF sites), OR nearly all of the water remains deeper than 6 ft during May-September
Cover (especially aquatic plants, woody debris) that supports algae and provides shelter from currents and predators is abundant in both the seasonal and permanent zone	.4	Cover (aquatic plants, woody debris.) that could support algae and provide shelter from currents and predators is lacking
Plant forms and species are highly diverse	.4	Only one plant form is present, and plant species richness is very low
Vegetation is well-interspersed with pools	.6	Vegetation and pools (if any) are in 2 separate areas or zones
Water quality (especially dissolved oxygen) is excellent	12	Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Highest Functioning	Suggested Score:	Minimal Functioning
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.4	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the site was entirely constructed from upland.
Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.	.2	Surrounding landscape contains no wetlands or ponds

· wow many ky	retain water well into the growing season may have many of these characteristics:
	prevalence of wetland plants (FAC or wetter, and especially OBL) intensive mortling & gleying of soils throughout most of the seasonally-inundated zone site is located in flatland terrain (not on slopes) site is large relative to its contributing watershed (>4% of total area) extensive microtopographic variation (many huminocks, puddles, etc.) absence of outlet channels, and/or site is managed for water storage.

Your Judgments: Function Capacity score =		or circle	e one o	f the fol	llowing:	
1.0	.8	.6	(.4)	.2	0	
Highest					Lowest	

Function Capacity (Judgmental Assessment of): Amphibian & Turtle Habitat

Highest Functioning	Suggested Score:	Minimal Functioning
Permanent water is absent, but shallow surface water that contains extensive partly-submerged fine-stemmed herbs¹ is extensive, and recedes very gradually during the months of January – May ² (i.e., during this period, there are at least 30 days when water levels are stable or have a vertical fluctuation of <2 inches).  OR:  Permanent water is extensive and contains (a) abundant underwater cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from predation, and (b) partly-submerged fine-stemmed herbs¹	, 4	Site never contains surface water  OR  Site is entirely surface water, which either (a) never fluctuates vertically (i.e., no seasonal zone is present), or (b) fluctuates too much – more than 2 inches during all 10-day periods, or (c) is devoid of any emergent herbs that are partly- submerged during the springtime, or (d) flows faster than 4 inches/second during the entire springtime, everywhere in the site, or (e) is mostly deeper than 40 inches and is bordered by a shoreline with a very steep slope
Bullfrogs and other non-native predators are absent		Bullfrogs and other non-native predators are abundant
If surface water everywhere in the site is flowing during springtime, there are at least 30 days when current velocities are slow (<4 inches/second)	A	If surface water everywhere in the site is flowing during springtime, there are never more than 30 days when current velocities are slow (<4 inches/second)
There is extensive and varied woody debris in the seasonal zone	12	There is no woody debris in the seasonal zone

Highest Functioning	Suggested Score:	Minimal Functioning
Either vegetation and pools are well- interspersed during high water level, or any woody vegetation bordering the larger pools is located mostly on their north end. <sup>3</sup> Microtopography is quite varied.	.4	Vegetation and pools are in separate areas of the site during high water level, and any woody vegetation bordering the larger pools is located mostly on their south end. Microtopography is too flat to allow many puddles to form (no hummocks, etc.)
Suitable basking sites for turtles and calling sites for frogs are present	.2	There are no basking sites for turtles or calling sites for frogs
Land cover in adjoining uplands is a mix of natural grassland and woodland; woodlands have extensive and varied woody debris	12	Land cover in adjoining uplands largely contains impervious surface, bare ground, lawns, and row crops
Shorelines are gently sloping	14	Shorelines, if present, are mostly steep
Busy roads are distant from the site	12	Busy roads adjoin the site
Many other wetlands (excluding flowing water) are present nearby	.2	There are no other wetlands (excluding flowing water) nearby
Water quality is excellent	.2	Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.4	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the entire site was constructed from upland.
Soils and submerged sediments contain a moderately thick organic layer (leaf litter, peat, decomposed organics, etc.)	.4	Soils and submerged sediments contain no organic layer, and are mostly hard-packed clay; or organic layer is so thick that water is chronically anoxic.

Emergent herbs with stem diameter of <3 mm (measured 2 inches below springtime water surface); this includes nearly all perennial herbs

except cattail.

Areas likely to retain water well into the growing season may have many of these characteristics.

Areas likely to retain water well into the growing season may have many of these characteristics. \_\_\_ prevalence of wetland plants (FAC or wetter, and especially OBL) intensive mottling & gleying of soils throughout most of the seasonally-inundated zone site is located in flatland terrain (not on slopes) extensive microtopographic variation (many hummocks, puddles, etc.) absence of outlet channels, and/or site is managed for water storage.

During the January-May period, 30 days of stable water levels are required for some aquatic amphibian eggs to mature, and during this time fluctuations of greater than 2 inches are lethal (Richter 1997).

<sup>3</sup> Vegetation located north of pools is less likely to block sunlight important to developing aquatic amphibians (Richter 1997).

Your Judgments: Function Capacity score =	,	or circl	e one o	f the fol	lowing:	
1.0	.8	.6	(.4)	.2	0	
Highest					Lowest	

Function Capacity (Judgmental Assessment of):
Breeding Waterbird Support (NA) Rivork

Highest Functioning	Suggested Score:	Minimal Functioning
The site contains many acres of permanent or nearly permanent surface water, or a large permanent wetland (excluding streams) is located nearby		Surface water is present for only a few week during April-June, OR  Nearly all of the water remains deeper than 6 ft during May-September
AND Water depths are predominantly shallow (2 to 24 inches) in April-August*		AND No permanent wetlands are located nearby.
Most of the shoreline is not steep		Most of the shoreline is steep
Larger pools of water are bordered by a wide, dense band of tall herbs and/or shrubs in April-August.		Larger pools, if present, are bordered by only a narrow band of sparse vegetation
About equal proportions of water and vegetation are present, and are well-interspersed during the April – August period		Vegetation and pools (if any) are in 2 separate areas or zones, not interspersed
Water levels do not abruptly rise a foot or more during April-June		Water levels are prone to quickly rise at least 1 foot during April-June
A large variety of herbs is present; the site is actively managed to control the spread of non-native or invasive species	and the second s	Vegetation cover is mostly comprised of one or a few non-native or highly invasive native species
Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, and water		Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
Busy roads are distant from the site		Busy roads border the site
Water quality is excellent		Water is heavily contaminated with pollutants
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.		Surrounding landscape contains no wetlands or ponds
Nest boxes, nest platforms, and other artificial structures intended to assist waterbird nesting are extensive and are regularly maintained.	1	No nest boxes, nest platforms, or other artificial structures intended to assist waterbird nesting are present, or they aren't well-naintained.
Part of the site is visited infrequently in April-June by humans on foot		None of the site is visited frequently by numans on foot during April-June

	prevalence of wetland plants (FAC or wetter, and especially OBL) intensive motiling & gleying of soils throughout most of the seasonally-inundated zone site is located in flatland terrain (not on slopes) extensive microtopographic variation (many hummocks, puddles, etc.)
our Indoments:	absence of outlet channels, and/or site is managed for water storage.

Function Capacity	score =		or circl	e one o	f the fol	llowing:	
**************************************	1.0	.8	.6	.4	.2	0	
	Highest					Lowest	

Function Capacity (Judgmental Assessment of):
Wintering & Migratory Waterbird Support (NA) Nivous

Highest Functioning	Suggested Score:	Minimal Functioning
The site contains extensive surface water during all or most of the fall-winter-spring period		The site contains very little surface water during all or most of the fall-winter-spring period
Water depths in most of the site during most of the fall-winter-spring period are shallow (<24 inches)		If forested, water depths during the fall- winter-spring period are always shallower than 24 inches in all of the site (shallower depths are permissible then in unforested wetlands).
A large portion of the site is inundated only seasonally		Of the water that is present, nearly all is present year-round.
The acreage of various depth categories is about equal during peak annual inundation		A single water depth category predominates.
Microtopographic variation (hummocks, puddles, etc.) is extensive		The substrate is very flat, essentially prohibiting the formation of puddles.
None of the site is visited frequently by humans on foot during September-April.		Water is heavily contaminated with pollutants
A large variety of herbs is present. The site is actively managed to control the spread of non-native or invasive species		Vegetation cover (except in farmed wetlands) is mostly comprised of one or a few non-native or highly invasive native species
Water quality is excellent		Virtually all of the site is visited frequently by humans on foot during April-June
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, agricultural lands, and water		Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
Surrounding landscape contains large acreage of hydric soil, wetlands, and water, including some with a different water regime than the assessed site.		Surrounding landscape contains no wetlands, ponds, or hydric soil.

Your Judgments: Function Capacity score =		or circl	e one o	f the fol	lowing:
1.0	.8	.6	.4	.2	0
Highest		-			Lowest

Songbird Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
Some part of the site contains surface water during all (or nearly all) of the year.	1.4	Surface water is never present at any time of the year.
The site contains a <u>large</u> acreage of closed-canopy forest, native shrubland, wet prairie, and/or emergent wetland.	2	Acreage of these is very small.
If the site is mostly native shrubland and/or forest, then (a) large-diameter trees are numerous, (b) snags of various sizes are abundant, (c) undercanopy shrub cover is extensive, and (d) a large variety of trees, shrubs and vines is present.	NA	If the site is mostly shrubland and/or forest, then (a) trees are very small, (b) snags are absent, (c) under-canopy shrub cover is lacking, and (d) the variety of trees, shrubs, and vines is small, and comprised almost entirely of non-native species.
If the site is mostly wet prairie and/or emergent wetland, then (a) a large variety of herbs is present, (b) the site is actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are concentrated in one or a few parts of the site.	.2	If the site is mostly prairie and/or emergent wetland, then (a) the variety of herbs is small, (b) the site is not actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are scattered widely throughout the site.
Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	12	Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
None of the site is visited frequently by humans on foot		Every part of the site is visited frequently by humans on foot
Busy roads are distant from the site	.2	Busy roads adjoin the site.

Your Judgments:

Function Ca	pacity score =	*	or circl	e one of	the fol	lowing:	
	1.0	.8	.6	.4	(.2)	0	
L	Highest					Lowest	

Function Capacity (Judgmental Assessment of):

Support of Characteristic Vegetation

Highest Functioning	Suggested Score:	Minimal Functioning
Trees, shrubs, and herbs are all present, and are well-interspersed throughout the site	.2	Only one plant form (tree, shrub, herb) is present
If trees are present, many are very old and large, with abundant evidence of regeneration	AM	If trees are present, all are young
If shrubs are present, all of the significantly present shrub species are natives	NA	If shrubs are present, they are comprised of just one species, and it is non-native
If herbs are present, all of the significantly present herb species are natives	14	If herbs are present, they are comprised of just one species, and it is non-native
Microtopographic relief is great hummocks, puddles, etc.)	.4	The substrate is very flat, essentially prohibiting the formation of puddles.
Springtime surface water levels drop very slowly (< 2 vertical inches per 30 days, average)	.4	Springtime water levels fluctuate or drop rapidly (>2 inches per 10 days, average)

Highest Functioning	Suggested Score:	Minimal Functioning
None of the site is visited frequently by humans on foot	.2	Every part of the site is visited frequently by
Busy roads are distant from the site	.2	Busy roads adjoin the site.
Land cover in the contributing watershed is predominantly "natural"	.2	Land cover in the contributing watershed largely contains impervious surface, bare ground lawns, and row crops.
Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	12	Land cover in surrounding buffer largely contains impervious surface, bare ground, lawns, and row crops.

Function Ca	apacity score =	,	or circl	e one (	of the fol	lowing:	
	1.0	8.	.6	.4	(.2)	0	
L	Highest					Lowest	

Now, summarize your function capacity assessments by recording them on the Assessment Summary Form (p. 59). Be sure to indicate that you used the Judgmental Method.

# Appendix B. Assessment of Function Capacity: Judgmental Method

Complete the following "qualitative assessments" of function only if you chose not to complete the reference-based assessments" that began on page 20.

Instructions: In each row, indicate with a checkmark if your site looks more like the "highest capacity" condition or the "minimal capacity" condition. Then circle a number on the scoring line below this table, based on your overall impression of the site's capacity to support this function. Alternatively, instead of checkmarks, you can assign a score to each row by placing a number in the center column of each row, e.g., 0 (minimal capacity) -to- 1.0 (highest capacity), and then combine the row scores in a manner of your choosing, perhaps weighting some rows more than others if you believe those indicators to have greater influence on a function. Whether based on mathematical operations or another way of synthesizing, be sure to circle your final score for the function on either or both of the shaded "Judgment Lines" at the bottom. Definitions of many of the terms are provided in Appendix A.

Function Capacity (Judgmental Assessment of):

Water Storage and Delay

Highest Functioning	Suggested Score:	Minimal Functioning
The proportion of the site that is inundated only seasonally is large. The seasonally-inundated parts are defined by flood marks on trees and shrubs, stunted plants, and/or distinctive assemblages of plant species.	.4	None of the site is inundated only seasonally The site is always comprised only of permanent water or a high water table without surface water.
Most of the surface water in the seasonally-inundated zone remains for a few days after each rain event, but not less or more.	.2	Water added from rain events empties quickly from all of the site, via outlets or percolation.  This often is evidenced by: lack of flood marks on trees and shrubsscarcity of wetland plants (few FAC or wetter) little or no mottling of soils throughout the seasonally-inundated zonesite is located on slopesite is flat (few or no puddles, etc.)presence of outlet channels

Function Capacity score			or circl	e one o	f the fol	lowing:
	1.0	.8	.6	.4	(.2)	0
Hi	ghest					Lowest

Sediment Stab	oilization	and	Phosp	horus	Retention
Highest Fund	tioning	10			

Highest Functioning	Suggested Score:	Minimal Functioning
High score was assigned to Water Storage & Delay function (inundation is long, frequent, deep, extensive).	.4	Low score was assigned to Water Storage & Delay function (water levels barely fluctuate).
Texture of the predominant substrate in the upper 12 inches of the seasonal zone is mostly clay, silty clay, sandy clay, clay loam, or native organic. See p. 83 for key to soil textures.	.2	Upper 12 inches of the predominant substrate in the seasonal zone is mostly sand or gravel.
Herbs, shrubs, and/or vines together always occupy a large percent of the ground cover in the seasonal zone. Very little soil is bare.	. 2	All or nearly all of the substrate in the seasonal zone is unvegetated.
Shallow pools and puddles are present and well-interspersed with herbaceous vegetation	.8	Shallow pools are absent at all times of the year
Substrates have never been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. No evidence of severe erosion within the site.	. 2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. Extensive evidence of severe scour or erosion may be present within the site. No sediment marks on trees or other plants.
Most of the site has complex microtopography (hummocks, puddles, etc.)	. 2	The substrate is uniformly flat, with no noticeable microtopography (no hummocks, etc.)

Your Judgments:

unction Capacity	score =	3	or circl	e one of	the fol	lowing:	
- Anna Anna Anna Anna Anna Anna Anna Ann	1.0	.8	.6	.4	(.2)	0	
	Highest					Lowest	

### Function Capacity (Judgmental Assessment of):

Nitrogen Removal

Highest Functioning	Suggested Score:	The state of the s
The state of the state of the state of the state of	f mottling and	I/or other features that indicate oxygen deficits in
High score was assigned to Water Storage & Delay function (inundation is long, frequent, extensive)	.4	Low score was assigned to Water Storage & Delay function (water levels barely fluctuate)
Some surface water or saturation remains year-round or nearly so, and is dispersed around the site such that water flow paths and residence times are long.	.2	No surface water or saturation remains year- round. If seasonal flooding occurs, the surface water is concentrated in one part of the site. e.g.,
Soil microbial processes are fairly mature, as possibly suggested by abundance of dead wood, thick and extensive soil organic layer, and many large-diameter trees	.2	channel or pond, and does not remain for long.  Soil microbial processes are not well-developed, as possibly suggested by lack of dead wood, thick soil organic layer, and/or large-diameter trees

Highest Functioning	Suggested Score:	Minimal Functioning
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site. None of the site was constructed from upland.	12	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling.
Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	Most of the site has no noticeable microtopography (no hummocks, puddles, etc.)
Site is burned annually or biennially	.2	Site has not been burned in recent years

Function Capacity score =	*	or circle	e one of	the fol	lowing:	
1.0	.8	.6	.4	(.2)	0	
Highest					Lowest	

Function Capacity (Judgmental Assessment of): Primary Production

Highest Functioning	Suggested Score:	Minimal Functioning
All of the site has vascular plants and/or water with algae.	.4	Much of the site is devoid of vascular plants and/or algae.
A variety of plant forms is present in about equal proportions (trees, shrubs, and herbs) and is well-distributed throughout the site	.6	Whatever plants are present are mainly of a single form (trees, shrubs, or herbs)
Some shallow (<3 ft) surface water remains year-round or nearly so, and in summer is dispersed around the site, e.g., many puddles	.2	The site is entirely dry during much of the year.
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling. Severe erosion may be evident within the site.
The site's contributing watershed contains no cropland, paved surface, buildings, or lawns especially in the parts closest to the site.	.2	The site's contributing watershed is almost entirely cropland, paved surface, buildings, and lawns – especially the parts closest to the site.

Your Judgment	s:						
Function Capac	city score =	,	or circle	e one of	the fol	lowing:	
	1.0	.8	.6	(.4)	.2	0	
	Highest					Lowest	

Thermoregulation

Highest Functioning	Suggested Score:	
	r riverine sites to other water l	at which part of the site is permanently inundated
Entire water surface in summer is shaded by a closed tree canopy or by topography.	.6	None of the water is shaded by vegetation or topography, and all of the water is shallower than 2m during summer.
Almost the entire site consists of water deeper than 6 ft.	.2	Very little of the site contains permanent water, and it never is deeper than a few inches.

Your Judgments:

Function Capacity score =	4	or circle	e one of	the fol	lowing:	
1.0	.8	.6	(.4)	.2	0	
Highest					Lowest	

Function Capacity (Judgmental Assessment of):

Resident Fish Habitat Support NA

Highest Functioning	Suggested Score:	The state of the s
Note: This function may be assessed only if par Impounding.	t of the site is	permanently inundated and the subclass is Riverine
Permanent water is extensive, and the site is connected only briefly with associated channels		Permanent water is very limited
Non-native fish species are absent		Non-native species dominate the resident fish component, although some natives are present
Shallow water area and proportion of the site that is inundated only seasonally is of sufficient extent and quality to support spawning by most species, and supports high densities of aquatic invertebrates		If present, shorelines are steep, dropping sharply into water deeper than 6 ft., with little or no seasonal zone being present
Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides year-round shelter from predation is abundant		Where water is present seasonally, cover that could shelter fish from predation is scarce or lacking.
Water quality (especially dissolved exygen) is excellent		Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Your Judgments:

Function Capacity score = . or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Anadromous Fish Habitat Support NA

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only inundation	if part of the	site is accessible to anadromous fish during seasonal
Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth		Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth
Floodwaters remain in the site for more than a few days		No surface water remains in the site for more than a few days
Non-native fish species are generally absent		Non-native fish species predominate
Substrates suitable for spawning or feeding are extensively present		Substrates suitable for spawning or feeding are scarce or absent
Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from currents and predators is abundant, at least in the seasonal zone		Cover that provides shelter from currents and predators is scarce or lacking from all parts of the site
Water quality (especially dissolved oxygen) is excellent		Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
Summertime temperature maxima do not exceed preferred range of anadromous fish		Summertime temperature maxima exceed limits lethal to anadromous fish

Your Judgments:

Function Capacity score =		7	or circl	e one of	f the fol	lowing:	
	1.0	.8	.6	.4	.2	0	
Highest	l					Lowest	

Function Capacity (Judgmental Assessment of):

Invertebrate Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
Surface water is permanent or nearly permanent, AND all of the water is shallower than 2 feet during May-September*	.2	Surface water is present only briefly (RI sites or not at all (SF sites), OR nearly all of the water remains deeper than 6 ft during May-September
Cover (especially aquatic plants, woody debris) that supports algae and provides shelter from currents and predators is abundant in both the seasonal and permanent zone	12	Cover (aquatic plants, woody debris.) that could support algae and provide shelter from currents and predators is lacking
Plant forms and species are highly diverse	.6	Only one plant form is present, and plant species richness is very low
Vegetation is well-interspersed with pools	.4	Vegetation and pools (if any) are in 2 separate areas or zones
Water quality (especially dissolved oxygen) is excellent	.4	Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Highest Functioning	Suggested Score:	Minimal Functioning
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the site was entirely constructed from upland.
Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.	.2	Surrounding landscape contains no wetlands or ponds

rell into the growing season may have many of these characteristics: revalence of wetland plants (FAC or wetter, and especially OBL) tensive motiling & gleying of soils throughout most of the seasonally-mundated zone te is located in flatland terrain (not on slopes)
lensive molling & gleving of soils throughout most of the sensonally invested de-
The same of the same (con our stopes)
te is large relative to its contributing watershed (>4% of total area)
tensive microtopographic variation (many hummocks, puddles, etc.) sence of outlet channels, and/or site is managed for water storage.
۰

Your Judgments: Function Capacity score =	,	or circle	e one of	the fol	llowing:	
1.0	.8	.6	(.4)	.2	0	
Highest					Lowest	

Function Capacity (Judgmental Assessment of): Amphibian & Turtle Habitat

Highest Functioning Suggested Minimal Functioning Score: Permanent water is absent, but shallow Site never contains surface water surface water that contains extensive partly-OR submerged fine-stemmed herbs1 is extensive, Site is entirely surface water, which either and recedes very gradually during the months (a) never fluctuates vertically (i.e., no seasonal of January - May 2 (i.e., during this period, zone is present), or (b) fluctuates too much - more there are at least 30 days when water levels are than 2 inches during all 10-day periods, or (c) is stable or have a vertical fluctuation of <2 devoid of any emergent herbs that are partlyinches). submerged during the springtime, or (d) flows OR: faster than 4 inches/second during the entire Permanent water is extensive and springtime, everywhere in the site, or (e) is mostly contains (a) abundant underwater cover (aquatic deeper than 40 inches and is bordered by a plants, logs, boulders, overhanging trees, deep shoreline with a very steep slope water spots, etc.) that provides shelter from predation, and (b) partly-submerged finestemmed herbs1 Bullfrogs and other non-native predators Bullfrogs and other non-native predators are are absent abundant If surface water everywhere in the site is If surface water everywhere in the site is flowing during springtime, there are at least 30 flowing during springtime, there are never more days when current velocities are slow (<4 than 30 days when current velocities are slow (<4 inches/second) inches/second) There is extensive and varied woody There is no woody debris in the seasonal debris in the seasonal zone

Highest Functioning	Suggested Score:	Minimal Functioning
Either vegetation and pools are well- interspersed during high water level, or any woody vegetation bordering the larger pools is located mostly on their north end. <sup>3</sup> Microtopography is quite varied.	.2	Vegetation and pools are in separate areas of the site during high water level, and any woody vegetation bordering the larger pools is located mostly on their south end. Microtopography is too flat to allow many puddles to form (no hummocks, etc.)
Suitable basking sites for furtles and calling sites for frogs are present	.2	There are no basking sites for turtles or calling sites for frogs
Land cover in adjoining uplands is a mix of natural grassland and woodland; woodlands have extensive and varied woody debris	.2	Land cover in adjoining uplands largely contains impervious surface, bare ground, lawns, and row crops
Shorelines are gently sloping	12	Shorelines, if present, are mostly steep
Busy roads are distant from the site	12	Busy roads adjoin the site
Many other wetlands (excluding flowing water) are present nearby	.2	There are no other wetlands (excluding flowing water) nearby
Water quality is excellent	.4	Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe crosion within the site.	.2	Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the entire site was constructed from upland.
Soils and submerged sediments contain a moderately thick organic layer (leaf litter, peat, decomposed organics, etc.)		Soils and submerged sediments contain no organic layer, and are mostly hard-packed clay; or organic layer is so thick that water is chronically anoxic.

Emergent herbs with stem diameter of <3 mm (measured 2 inches below springtime water surface); this includes nearly all perennial herbs

except catail.

Areas likely to retain water well into the growing season may have many of these characteristics.

Areas likely to retain water well into the growing season may have many of these characteristics. prevalence of wetland plants (FAC or wetter, and especially OBL) intensive mottling & gleying of soils throughout most of the seasonally-inundated zone site is located in flatland terrain (not on slopes) extensive microtopographic variation (many hummocks, puddles, etc.) absence of outlet channels, and/or site is managed for water storage.

During the January-May period, 30 days of stable water levels are required for some aquatic amphibian eggs to mature, and during this time fluctuations of greater than 2 inches are lethal (Richter 1997).

Vegetation located north of pools is less likely to block sunlight important to developing aquatic amphibians (Richter 1997).

You	Jud	gme	ents:
-	1999		The state of the s

Function Capacity score =			or circl	e one o	f the fol	lowing:
	1.0	.8	.6	.4	(.2)	0
High	est					Lowest

Function Capacity (Judgmental Assessment of):
Breeding Waterbird Support (NA) Airport

Highest Functioning	Suggested Score:	Minimal Functioning
The site contains many acres of permanent or nearly permanent surface water, or a large permanent wetland (excluding streams) is located nearby  AND Water depths are predominantly shallow (2 to 24 inches) in April-August*		Surface water is present for only a few week during April-June, OR Nearly all of the water remains deeper than it during May-September No permanent wetlands are located nearby
. Most of the shoreline is not steep		Most of the shoreline is steep
Larger pools of water are bordered by a wide, dense band of tall herbs and/or shrubs in April-August.		Larger pools, if present, are bordered by only a narrow band of sparse vegetation
About equal proportions of water and vegetation are present, and are well-interspersed during the April – August period		Vegetation and pools (if any) are in 2 separat areas or zones, not interspersed
Water levels do not abruptly rise a foot or more during April-June		Water levels are prone to quickly rise at least 1 foot during April-June
A large variety of herbs is present; the site is actively managed to control the spread of non-native or invasive species	diameter	Vegetation cover is mostly comprised of one or a few non-native or highly invasive native species
Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, and water		Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
Busy roads are distant from the site		Busy roads border the site
Water quality is excellent		Water is heavily contaminated with pollutants
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
Surrounding landscape contains large creage of wetlands, including some with a lifferent water regime than the assessed site.		Surrounding landscape contains no wetlands or ponds
Nest boxes, nest platforms, and other rtificial structures intended to assist waterbird esting are extensive and are regularly naintained.	1	No nest boxes, nest platforms, or other artificial structures intended to assist waterbird nesting are present, or they aren't well-naintained.
Part of the site is visited infrequently in pril-June by humans on foot  Areas likely to retain water well into the waterbird breeding see	Ī	None of the site is visited frequently by numans on foot during April-June

prevalence of wetland plants (FAC or wetter, and especially OBL) intensive mottling & gleying of soils throughout most of the seasonally-inundated zone site is located in flatland terrain (not on slopes)
extensive microtopographic variation (many hummocks, puddles, etc.) absence of outlet channels, and/or site is managed for water storage.

Function Capacity score = . or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Function Capacity (Judgmental Assessment of):
Wintering & Migratory Waterbird Support (NA) Along

Highest Functioning	Suggested Score:	Minimal Functioning
The site contains extensive surface water during all or most of the fall-winter-spring period		The site contains very little surface water during all or most of the fall-winter-spring period
Water depths in most of the site during most of the fall-winter-spring period are shallow (<24 inches)		If forested, water depths during the fall- winter-spring period are always shallower than 24 inches in all of the site (shallower depths are permissible then in unforested wetlands).
A large portion of the site is inundated only seasonally		Of the water that is present, nearly all is present year-round.
The acreage of various depth categories is about equal during peak annual inundation		A single water depth category predominates.
Microtopographic variation (hummocks, puddles, etc.) is extensive		The substrate is very flat, essentially prohibiting the formation of puddles.
None of the site is visited frequently by humans on foot during September-April.		Water is heavily contaminated with pollutants
A large variety of herbs is present. The site is actively managed to control the spread of non-native or invasive species		Vegetation cover (except in farmed wetlands) is mostly comprised of one or a few non-native or highly invasive native species
Water quality is excellent		Virtually all of the site is visited frequently by humans on foot during April-June
Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, agricultural lands, and water		Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
Surrounding landscape contains large acreage of hydric soil, wetlands, and water, including some with a different water regime han the assessed site.	-	Surrounding landscape contains no wetlands, ponds, or hydric soil.

unction Capacity score =		or circl	e one o	f the fol	lowing:	
1.0	.8	.6	.4	.2	0	
Highest					Lowest	

Songbird Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
Some part of the site contains surface water during all (or nearly all) of the year.	12	Surface water is never present at any time of the year.
The site contains a <u>large</u> acreage of closed- canopy forest, native shrubland, wet prairie, and/or emergent wetland.	.2	Acreage of these is very small.
If the site is mostly native shrubland and/or forest, then (a) large-diameter trees are numerous, (b) snags of various sizes are abundant, (c) undercanopy shrub cover is extensive, and (d) a large variety of trees, shrubs and vines is present.	NA	If the site is mostly shrubland and/or forest, then (a) trees are very small, (b) snags are absent. (c) under-canopy shrub cover is lacking, and (d) the variety of trees, shrubs, and vines is small, and comprised almost entirely of nonnative species.
If the site is mostly wet prairie and/or emergent wetland, then (a) a large variety of herbs is present, (b) the site is actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are concentrated in one or a few parts of the site.	.6	If the site is mostly prairie and/or emergent wetland, then (a) the variety of herbs is small, (b) the site is not actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are scattered widely throughout the site.
Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
None of the site is visited frequently by numans on foot	.2	Every part of the site is visited frequently by humans on foot
Busy roads are distant from the site	12	Busy roads adjoin the site.

Your Judgments:

unction Capac	city score =		or circl	e one of	the fol	lowing:	
	1.0	.8	.6	.4	(.2)	0	
	Highest					Lowest	

Function Capacity (Judgmental Assessment of):

Support of Characteristic Vegetation

Highest Functioning	Suggested Score:	Minimal Functioning
Trees, shrubs, and herbs are all present, and are well-interspersed throughout the site	.6	Only one plant form (tree, shrub, herb) is present
If trees are present, many are very old and large, with abundant evidence of regeneration	NA	If trees are present, all are young
If shrubs are present, all of the significantly present shrub species are natives	.6	If shrubs are present, they are comprised of just one species, and it is non-native
If herbs are present, all of the significantly present herb species are natives	.6	If herbs are present, they are comprised of just one species, and it is non-native
Microtopographic relief is great (hummocks, puddles, etc.)	.2	The substrate is very flat, essentially prohibiting the formation of puddles.
Springtime surface water levels drop very slowly (< 2 vertical inches per 30 days, average)	.2	Springtime water levels fluctuate or drop rapidly (>2 inches per 10 days, average)

Highest Functioning	Suggested Score:	Minimal Functioning
None of the site is visited frequently by humans on foot	12	Every part of the site is visited frequently by humans on foot
Busy roads are distant from the site	12	Busy roads adjoin the site.
Land cover in the contributing watershed is predominantly "natural"	12	Land cover in the contributing watershed largely contains impervious surface, bare ground lawns, and row crops.
Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	Land cover in surrounding buffer largely contains impervious surface, bare ground, lawns, and row crops.

Your Judgments:
Function Capacity score = , or circle one of the following:

1.0 .8 .6 .4 .2 0

Highest Lowest

Now, summarize your function capacity assessments by recording them on the Assessment Summary Form (p. 59). Be sure to indicate that you used the Judgmental Method.